ELECTRICAL WEST

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Human PUBLIC RELATIONS

WHAT is this thing we call the public whose good will so affects all business? It is people, individually and in the mass. Without people there can be no business. So all business should accept this precept: To succeed, all policies, actions and service must be based on human understanding. Thus the religion of business becomes human relations.

MARCH 1935

LET'S LOOK AHEAD

The lighting of transcontinental highways is coming.

Air-conditioning is a rapidly growing infant.

Stores are setting the pace for strong competition in better lighting for better profits.

Industrial plants are following for the same reasons.

Homes are far more numerous than stores and factories, and are miserably under-saturated as to the use of electrical energy and equipment for heat, light and power.

There are big jobs ahead for all of us.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

Edison

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Code
No. 4-611

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ELECTRICAL WEST

With which are consolidated the "Electrical Journal," the "Journal of Electricity, Power and Gas," and the Journal of Electricity."

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Contents for March 1935

Volume 74 Number 3

Human Nature—A Puzzle....17
Who Is Too Poor.....19
Engineering Symposium 20
Business-Building Brainstorms.25
Cooperation On Parade.....28
Bill Jones Speaks.....36
Codes in Operation.....37
Rural Load Building 40
Realm of Science 42
Editorial 44
Significant Trends 46
News of Note.....54
Where To Buy It in the West..63

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• A vivisectionalist probing into the body of public service companies might discern that human nature, to a large extent, is responsible for the rash of "anti" propaganda that has broken out in the past few years. Beginning in this issue is a series of four articles dealing with that fragile something called public opinion. Reading them will induce the burning of much midnight oil, pardon, we meant study lamps.

• Long-term, low-payment financing plans for appliances are being scrutinized by business building associations and societies. While there are many problems involved, it seems to be the only way to bring the "abundant life," so glibly mentioned by the alphabet jugglers, within the reach of many. Studying the idea won't do any harm and it might do a lot of good. On pages 28 and 54 recent thoughts on the subject are presented.

• Speaking of appliance merchandising, regular readers of the consolidated merchandising report of Cooperation On Parade find that it is a helpful yardstick for their own business. This month this useful index of business building activity appears on page 35.

• Utility operators in territories where precipitation is high probably look with envy upon the irrigation load. Proving that the grass is always greener on the other side of the fence is the article on the results of irrigation in the Northwest on page 40. If agricultural pumping is profitable in Tillamook county (Oregon) it is our contention that a lot of sales organizations can cease hunting for new load building ideas and go to work helping the farmer build more profits and incidently help the growth of the output curve.

NEXT MONTH

• In the April issue will appear the winners of the first heat of Electrical West's Brainstorm contest. Six months has elapsed since its inception and during that time many splendid ideas have been submitted by the industry. $50, split three ways, is the reward for the best ideas. Watch for the announcement of the winners.

• Also in April, the P.C.E.A. will hold a conclave in Fresno to hear the winning papers on the problems presented in the December issue. More prizes! There just seems to be no end to the ways that extra money can be earned by giving a little earnest thought to our jobs.

Sales Talks that SOLD Appliances . . .

CASE HISTORY #3
Selling an Electric Water Heater

BILL SMITH, master salesman, with an eye on the seasonal nature of the appliance business, has tied in with the local utility's drive on electric water heaters by displaying these units both in his window and on the floor. Summer is coming and Bill decides that selling "hot water service by electricity" can be both profitable to himself and beneficial to his customers. As prospects, he selected a group of former customers, called on their homes to see if his products were giving satisfactory service, and, using this entree to create interest in water heating, induced several to come down to his store. Mrs. Brown, one of the later, has just entered.

¶ Bill employs good psychology in his follow-ups to see if his customers are satisfied. It also enables him to cultivate the soil for another sales presentation at his store. Smart preparation makes selling easy.

BILL: "It was very kind of you to come in. I am sure you will feel well repaid when you find how your electrical service can provide the luxury of an adequate supply of hot water economically and automatically. From your standpoint, Mrs. Brown, hot water is a labor-saver. It makes house cleaning, dish washing, laundering, and care of the children so much easier. Have you ever thought just how many times a day the hot water faucets in your home are turned on?"

MRS. BROWN: "No, I haven't. But I suppose it is a good many."

¶ Bill gets his prospects interest immediately by stating how electric water heating can help her. Then he explains the inadequacy of most water heating systems.

BILL: "You are right. But it will probably surprise you to know that investigators have counted over one hundred uses every day for hot water in the average home. Naturally all of these demands can't be supplied in most homes because the hot water system is both inadequate and generally dependent upon the heating system. Until you have enjoyed automatic water heating you can't appreciate how much help a plentiful supply of hot water can be."

MRS. BROWN: "What you say is probably very true, but I don't see how you can get much more hot water in our house without a new and expensive installation."

BILL: "That's the reason I asked you to come in today. You see, summer is coming and soon your furnace, the usual source of hot water, will be shut down. Not only that, but summer demands for hot water are greater than ever. There are additional showers, the laundering of the children's play suits because they play outdoors more and get dirtier, and a hundred other demands. Now this water heater will supply adequate hot water for the average family at a surprisingly low cost. Furthermore, it is completely automatic. It won't give off any heat to aggravate summer weather. Since it is entirely covered, with no parts extending where even a child can be harmed, and because the element is sealed within a chamber where it takes nothing out of the air and produces no soot nor smoke, this heater makes hot water as clean, safe, and convenient as your electric light."

MRS. BROWN: "It would be nice to have something like this during the summer months, but don't you think it would be extravagant, because during the winter we get our hot water from the furnace?"

¶ Has Bill made a mistake by selling too hard on summer usage? The prospect catches him up, but watch how adroitly Bill has led the prospect into listening to the REAL story of year-round economy.

BILL: "I'm glad you brought that up. This heater should be used the year around, because actually with the new electric water heating rates the power company gives, heating water with electricity is even less expensive than heating it with the hot water coils of your furnace."

MRS. BROWN: "Oh, but that's impossible. We would have to pay for electricity, but the hot water from the furnace costs nothing; we have to burn the fuel to heat the house anyway."

BILL: "It does seem contradictory, doesn't it? But you see it takes heat from the fuel to raise the temperature of the cold water in the furnace coils. When you put fuel in your furnace it takes not only enough to heat the house, but an extra amount to heat the water. Purdue University, one of the country's leading engineering schools, made actual tests and their engineers found that over 23 per cent of the fuel consumed in the average home was used to heat the water in the furnace coils. Just think what

that means. For every four tons of coal you buy to heat your home, you buy one extra ton to heat the water. It is a very uneconomical way of heating too, not only because your hot water tank is uninsulated and wastes much of the heat in the water, but also because much of the hot water itself is wasted. One time you have to dilute it with cold water when you have a hot fire, and the next time there is not enough hot water, because the fire was almost out. That's logical isn't it?"

¶ Notice that Bill substantiates his statement about fuel consumption with figures from a highly authorative source. Back your facts with proof.

MRS. BROWN: "Yes, it is, but you say these heaters are economical. It must take a lot of electricity to equal a ton of coal. How much does it cost to operate?"

¶ Here Bill uses the prospect's question to explain quality. Before he answers the question he sums up what she is buying before mentioning the price of operation.

BILL: "If this heater warmed water with electricity as wastefully as the average furnace does with fuel, it would be expensive. But this heater is scientifically designed for high efficiency. The electric heating units are right in the water so that every bit of electricity used raises the temperature of the water and not the surrounding air. It is completely enclosed in almost four inches of high quality insulation. That prevents the water from losing its heat once its temperature has been raised. When the water gets just the right temperature for usage the heater cuts itself off automatically. If the temperature falls below the proper point it automatically and noiselessly goes back to work. There is no waste there, is there, Mrs. Brown? That's why this heater will provide an abundant, reliable supply of hot water at just the right temperature to make your house-work easier and your family more comfortable for as little as 8⅔ cents a day. For less than the price of two tons of coal, you can enjoy the modern convenience of hot water the year around."

MRS. BROWN: "Do you mean that I can heat water with this electric heater for about the same as the coal I'm using?"

BILL: "Yes, you are actually paying for automatic hot water service without getting it."

¶ A ten-strike! The prospect sums up all of Bill's arguments in a question which Bill converts into the fine selling phrase, "paying for it without getting it." Her next question on performance gives Bill another chance to stress quality.

MRS. BROWN: "But aren't automatic devices liable to cause a lot of trouble?"

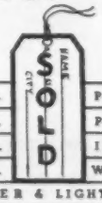
BILL: *(smiling)* "I can see how a person might feel that way, but this heater is almost as simply constructed as an electric light. There is nothing that can go wrong with it. The electric units are extremely rugged and reliable. The insulation is vermin proof and this specially treated cover not only keeps out the moisture and protects the insulation from damage, but also gives it a fine appearance that is easily cleaned. Because it is good-looking and easily cleaned it could be installed in your kitchen or, if you prefer, its automatic features and complete reliability make it possible to install it in a closet or the basement and forget about it.

MRS. BROWN: "Is it much trouble to install?"

BILL: "Very easy—we'll just connect the water pipes and the electric circuit and it is done." *(Sensing his prospect is sold, he drives for an order.)* "Now this high quality automatic heater which will save hours of your time and much of your work, add to the comfort and health of your family, and make a big saving in your fuel bill, costs only $..... and it can be handled on an exceptionally easy installment basis. For a small amount per month you can buy the heater and pay its operating cost, too. Did you know, Mrs. Brown, that over 25 of these modern heaters were sold last week right here in this city? When people learn about the many advantages of electric water heating, how economical it is, and how easily they can obtain it, they can't help but buy, because, as I said a few minutes ago, they are paying for modern hot water service without getting it! I can assure you, Mrs. Brown, that by substituting the efficiency of electricity for your present water heating method, you will save enough to have this heater and all its conveniences with but very little added to the present expenses of running your household. Now, if you will sign right here, I'll take care of all the details. I know that you will be more than satisfied with your new electrical servant."

MRS. BROWN: *(signing)* "After the way you have explained it, it just seems to be good common sense to have one. I am glad that you were kind enough to explain it to me because hot water is a problem in our family, but I didn't think it could be provided so economically."

¶ This sale looks easy and it was easy because Bill used his head and did a fine selling job. A call at her home demonstrated to his prospect interest in her welfare. When she came into the store the very first thing he did was to rivet her attention on his product by telling her how it would help her. Then he smoothly and skillfully went to work to prove why she needed it and why it was a real economy. Finally he asked for the order. Bill's selling was successful because it was well planned and was executed with enthusiasm, skill, and tact.



CALIFORNIA OREGON POWER CO. | PORTLAND GENERAL ELECTRIC CO.
MOUNTAIN STATES POWER CO. | PUGET SOUND POWER & LIGHT CO.
PACIFIC POWER & LIGHT CO. | IDAHO POWER COMPANY
NORTHWESTERN ELECTRIC CO. | WASHINGTON WATER POWER CO.
★ UTAH POWER & LIGHT COMPANY ★

How Liquid-filled Bushings on G-E Power Transformers Contribute to

CONTINUITY OF SERVICE -- LOW MAINTENANCE COSTS

THE liquid-filled bushings on G-E power transformers are built to meet the increasingly rigorous requirements of modern operating practices.

Because of their scientific proportions and liquid filling, they will not be injured by excess potentials, either 60-cycle or impulse.

The liquid filling prevents the formation of voids with the resulting entrapping of air. This eliminates the possibility of internal discharges under high stress, either 60-cycle or impulse, and minimizes the possibility of radio interference.

Cracks in the porcelain that may result from abuse during shipment or handling are easily discovered before installation, by the most casual inspection.

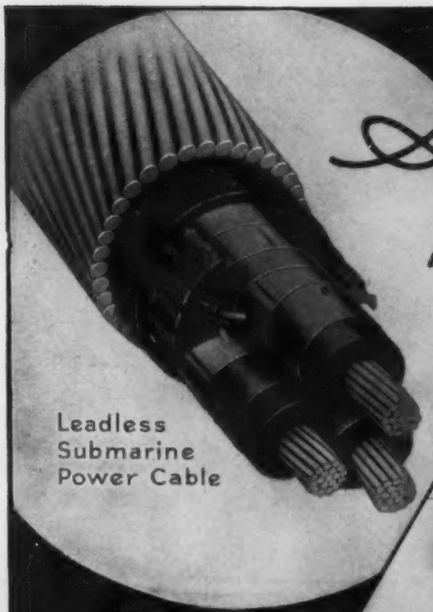
The liquid-filled bushing provides the advantages of liquid and solid insulations in combination—the same combination that made possible the development of the high-voltage transformer.

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

310-6

GENERAL ELECTRIC

Specialists in COMPOSITE CABLES



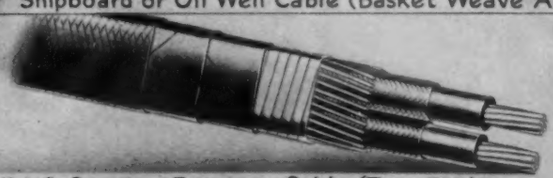
Leadless Submarine Power Cable

Oil Well Rope (Conducting Center)

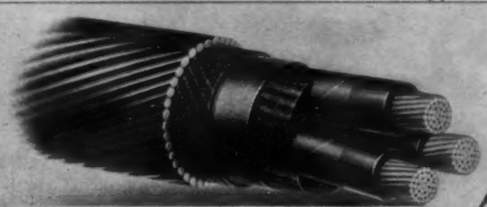
Service Entrance Cable

Armorlokt Parkway Cable

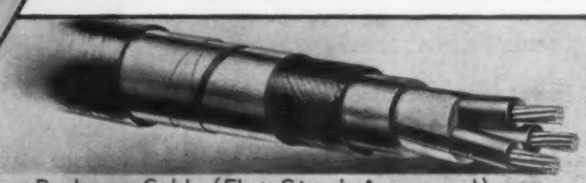
Shipboard or Oil Well Cable (Basket Weave Armored)



A.E.I.C. Service Entrance Cable (Type E.G.)



Leadless Bore Hole Cable



Parkway Cable (Flat Steel Armored)

ELECTRICAL CABLE—The thought usually brings to mind "copper conductors." As a matter of fact these are frequently but a small fraction of the total weight or volume of the cable. Other metals, particularly steel, play important roles in cable design and operation. A few typical cases are illustrated. **American Steel & Wire Company** specializes in the production of both steel and insulated copper members of such cables and is prepared to furnish practically every type in which these members enter. Inquiries on standard or special designs are earnestly solicited.

AMERICAN STEEL & WIRE COMPANY

United States Steel Corporation Subsidiary

Pacific Coast Distributors

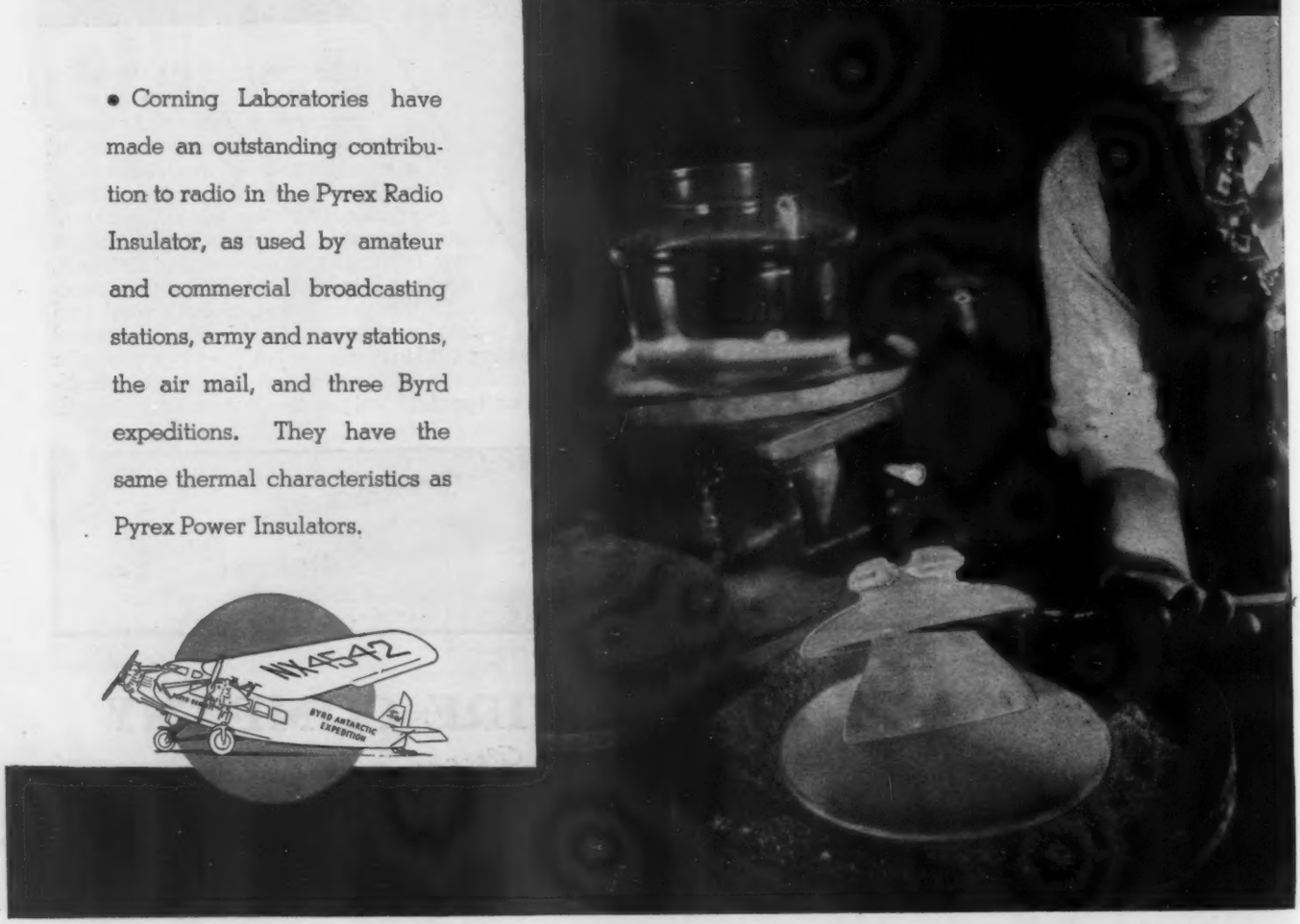
COLUMBIA STEEL COMPANY

SAN FRANCISCO LOS ANGELES PORTLAND SEATTLE

THE TEST NO CLIMATE *Can Duplicate*

FROM 98 BELOW

• Corning Laboratories have made an outstanding contribution to radio in the Pyrex Radio Insulator, as used by amateur and commercial broadcasting stations, army and navy stations, the air mail, and three Byrd expeditions. They have the same thermal characteristics as Pyrex Power Insulators.



TO 208 ABOVE

In a fraction of a Minute

Admiral Byrd knows climate at its worst, but he finds no climate that approaches the tests Pyrex Insulators have met in the Corning Laboratories.

First, chilled in a temperature of 98° F below zero. Then, in a flash, plunged into a heat of 208° F. And the Pyrex Insulator comes through with no cracks, no chipping—still a perfect insulator.

This ability to withstand wide ranges and sudden variations of temperature that are unapproached by any climate explains why they are giving faithful service in the tropics and in the arctics, in heat and cold, under ice, sleet and blazing sun.

In any climate and any weather, Pyrex Insulators give maximum protection to the line

Pyrex

"PYREX" *is a trade-mark and indicates manufacture by*

CORNING GLASS WORKS
CORNING, NEW YORK

POWER INSULATORS

Distribution Transformers with CO-ORDINATED STUD BUSHINGS

Pioneered by Allis-Chalmers and now backed by six years operating experience!

Bank of Three 10 kva 2400 Volt Type SB Transformers.

SIX years ago Allis-Chalmers engineers placed in commercial service distribution transformers with coordinated stud type bushings. These Type SB transformers were the first surge-proof distribution transformers ... surge-proof by themselves and without auxiliary devices. Type SB transformers with demountable stud type bushings and solderless connectors on H.V. and L. V. have built an enviable record for trouble-free service and low cost of installation and maintenance. *They are available immediately from warehouse stocks located all over the U. S.*

For detailed information concerning other features of this transformer communicate with the nearest Allis-Chalmers district office.

ALLIS-CHALMERS

— Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, U.S.A. —

NEWS!

FOUR YEAR PROGRAM OF RESEARCH SOLVES THE PROBLEM OF BRUSH UNIFORMITY ON HEAVY DUTY SERVICE

THE NEW "SA" SERIES . . . FOR HEAVY DUTY D. C. POWER SERVICE!

FUNDAMENTAL brush properties essential to satisfactory performance on heavy duty service have been more accurately determined.

New combinations of materials possessing these properties have been developed.

Exact methods of production insuring control of uniformity have been devised and established.

The result is the New "SA" Series of brushes designed for a wide range of applications on all types of stationary motors and generators used on heavy duty direct current power service.

The New "SA" Series consists of five carefully determined grade varieties known as SA-25, SA-30, SA-35, SA-40 and SA-45, all definitely graded with respect to commutating properties.

The exceptional uniformity of the grades in the "SA" Series has been fully established by field service tests. This uniformity applies to performance as well as to the mechanical and electrical characteristics of the brushes themselves.

Further information on the advantages and economies of these new grades in your particular service will be supplied upon request.

In addition to the regular trade marks — the Three Pyramids, the Silver Strand Cable and the Grade Number — these new grades are further identified by the **Double Engraved Lines** (Trade Mark Registered) down the center of one side of the brush.

NATIONAL CARBON COMPANY, INC., Carbon Sales Div., Cleveland, Ohio

Unit of Union Carbide UCC and Carbon Corporation

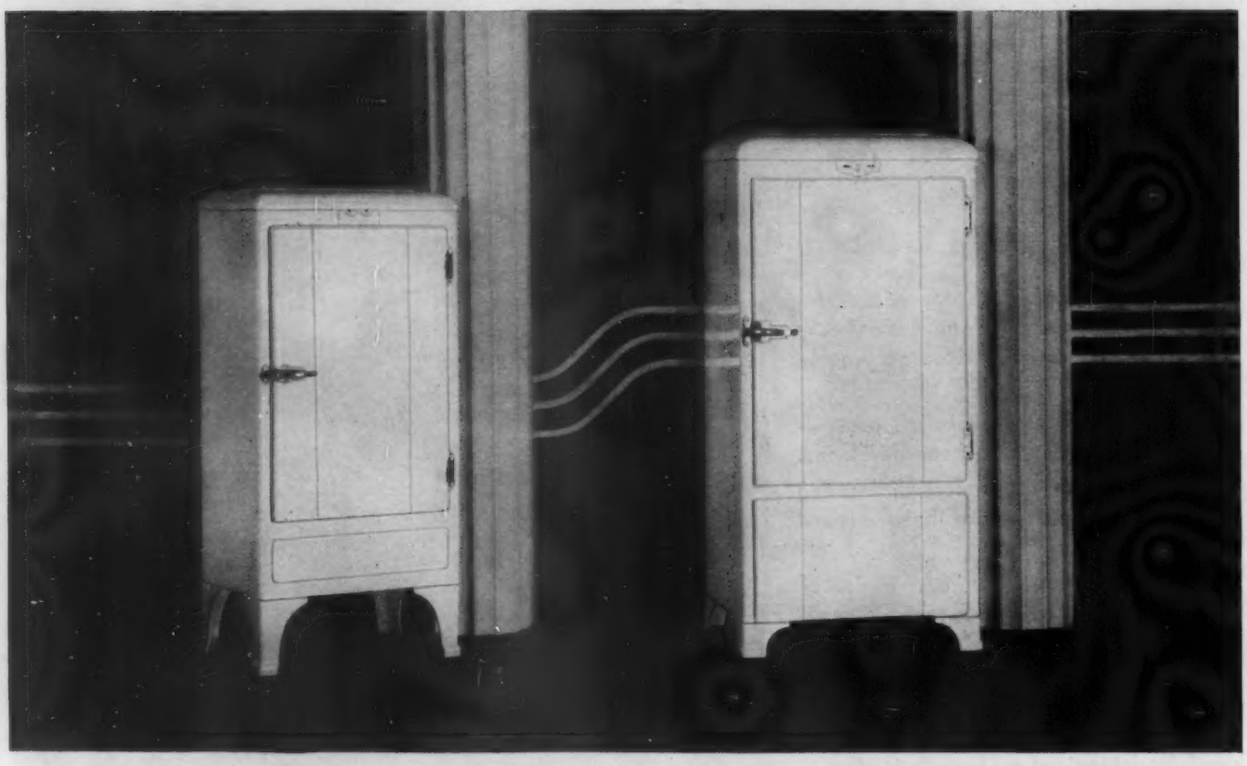
BRANCH SALES OFFICES: NEW YORK PITTSBURGH CHICAGO SAN FRANCISCO

ANNOUNCING THE

*NOW IN THE

16 BEAUTIFUL NEW MODELS • A DEVELOPMENT THAT MAKES MORE COLD

THE STANDARD SERIES FRIGIDAIRE '35 THE MASTER SERIES FRIGIDAIRE '35



INTO the Frigidaire line for 1935 we've put the biggest assortment of selling points any line of refrigerators has ever had.

Here are small Frigidaires, large Frigidaires and all sizes in between. And prices start way down low. You can offer every customer the size he wants at the price he wants to pay.

And no matter which model your customer selects, you will be able to recommend it as a refrigerator that will give him these two essentials: (1) Foods kept safely at temperatures below 50°. (2) Quick freezing of ice and desserts —even in the hottest weather.

The Frigidaire '35 performs these two services better. And here's why. Every model is equipped with that newest Frigidaire development—the Super Freezer.

The Super Freezer makes possible a Complete Refrigeration Service. It provides all the cold that's needed—*and the right kinds of cold*—all in the same cabinet. *Fast freezing* for making ice cubes and desserts. *Frozen storage* for meats

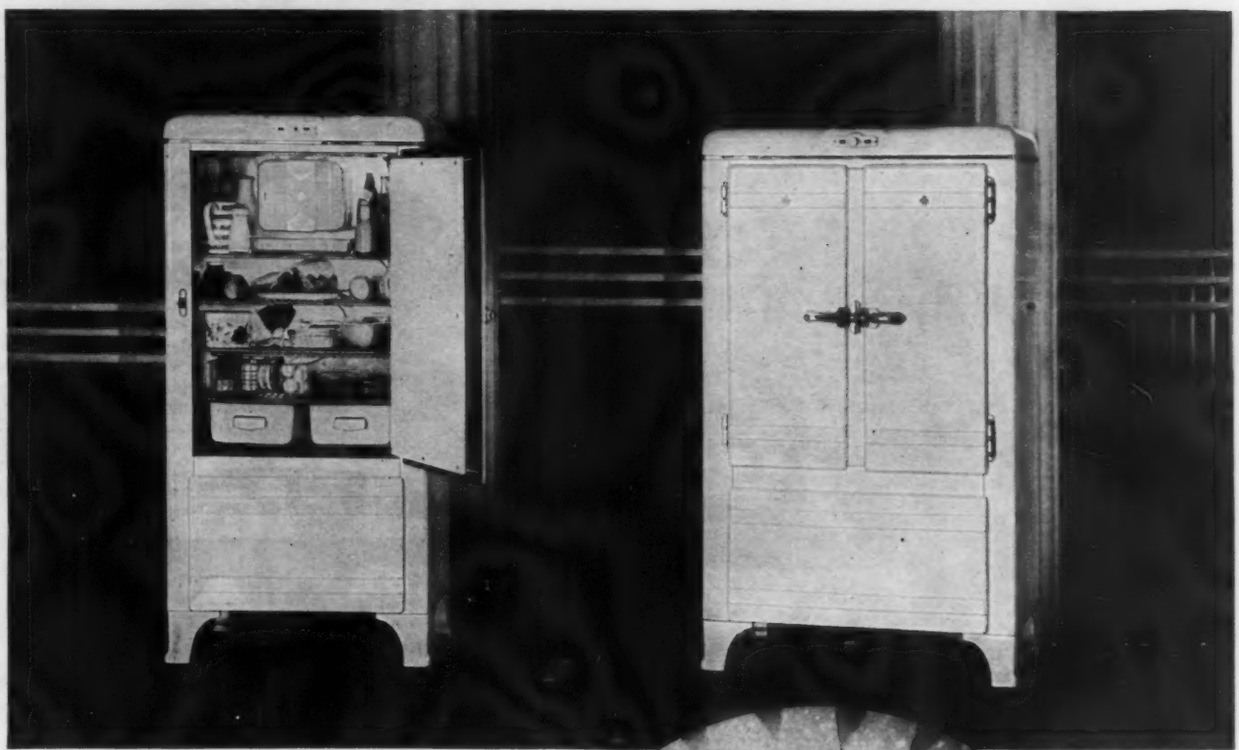
**Three million Frigidaires have been built and the manufacture of the Fourth Million has begun. No other refrigerator has achieved such amazing popularity.*

FRIGIDAIRE '35

FOURTH MILLION

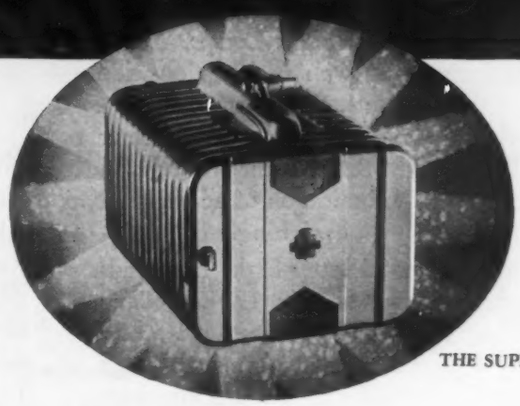
EVERY ONE WITH THE SUPER FREEZER • FOR USERS • MORE SALES FOR DEALERS

THE SUPER SERIES FRIGIDAIRE '35 THE DE LUXE SERIES FRIGIDAIRE '35



and ice cream. *Extra-cold storage* for keeping a reserve supply of ice cubes. *Moist storage* for vegetables and fruits. *Normal storage* below 50° for foods requiring dry, frosty cold.

And the new line is being presented to the public by the most impressive advertising campaign in the company's history. If you want to see real profits come swinging your way in 1935, it will pay you to investigate the Frigidaire franchise now. Frigidaire Corporation, Subsidiary of General Motors Corp., Dayton, Ohio.

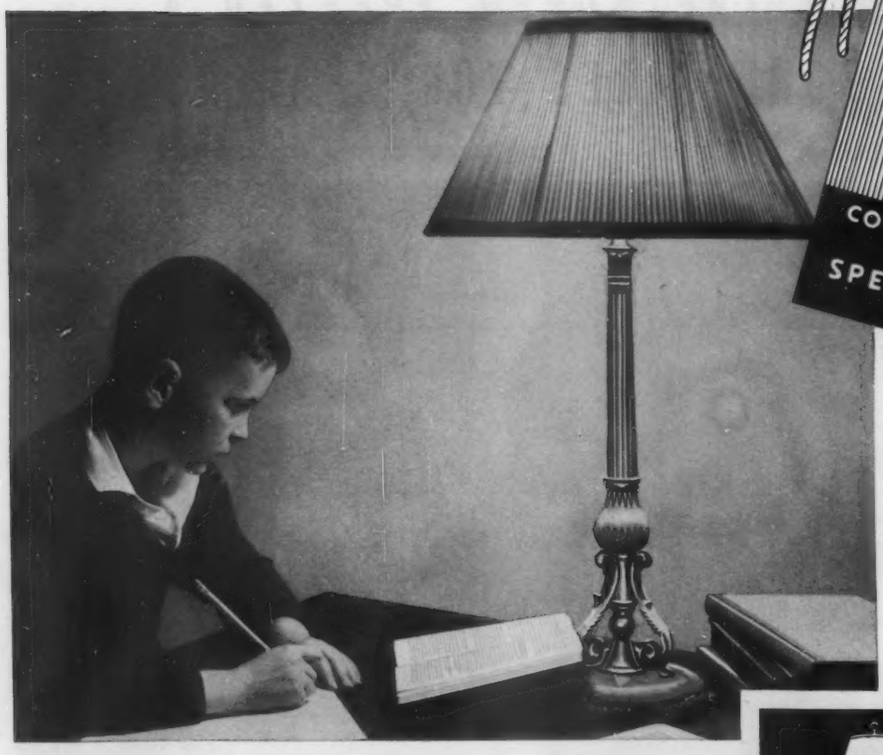


THE SUPER FREEZER

Frigidaire '35

THE GENERAL MOTORS REFRIGERATOR

WHAT 317,725 I.E.S. TAGS MEAN TO UTILITIES



● Only lamps having this tag are approved by the Illuminating Engineering Society and endorsed for lighting effectiveness by the Lighting Committee of the Edison Electric Institute.

● Millions of people—thousands of them your customers — will see Better Sight Lamp advertising this year in these magazines: *Saturday Evening Post... Collier's ... Liberty... Time... American Weekly... Ladies' Home Journal... American Magazine... Popular Mechanics... Parents'... Good Housekeeping... McCall's... Woman's Home Companion.*

● The fact that 317,725 I. E. S. tags were issued up to December 27, 1934 shows the amazing sales appeal of the new I. E. S. Better Sight Lamps. Never before have any lamps ever won such nation-wide acceptance in so short a time. Retail stores everywhere report tremendous sales... increased customer interest in the Better Light-Better Sight program. In themselves, the tags are an indication of added load for utilities. But that's only a beginning.

There will be more I. E. S. Better Sight Lamp advertising in 1935 than there was in 1934. General Electric, in the interest of better vision, will spend more money advertising these new lamps, although G. E. does not make them. Lamp manufacturers are bringing out newer, more beautiful models. They are being advertised and merchandised on a greater scale than ever. The whole electrical industry is behind the movement to popularize I. E. S. Better Sight Lamps.

Lighting directors and home lighting supervisors now have more effective reasons than ever to urge department stores and other portable lamp outlets to stock the new I. E. S. Better Sight Lamps . . . in table, floor, and wall models.

Each I. E. S. Better Sight Lamp installed is an added load builder for the utility. For further information, write to General Electric Company, Department 166, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC

HOTPOINT

Proudly Presents

its 1935 RANGES

Styled TO THE MODERN TREND

Priced TO THE MODEST PURSE

★ During the pioneering days of electric cookery, Hotpoint engineers labored diligently to bring the electric range to a high state of perfection. With the achievement of Hi-Speed Calrod, the cooking coil which assured the widespread acceptance of electric cookery, Hotpoint engineers turned their attention to styling.

Helen Hughes Dulany, the woman who proved that homemakers want modern styling in equipment, gives the new Hotpoint ranges their charming beauty. Her alert mind and deft hand have added modern lines which will give a new speed to electric range sales.

Hotpoint feels that all electrical men will admit that there is a just reason to be proud of its new 1935 line of ranges. Nothing has been spared in styling. Performance has been proved in laboratory and home. The day of the perfected electric range is here. One glance at the beautiful new models pictured on the inside pages tells the experienced eye that they are timed to modern tempo.

ELECTRIC Hotpoint RANGES

WATER HEATERS

HELEN HUGHES DULANY

This foremost woman industrial stylist has balanced modern trends with everyday needs. She knows what the American housewife wants. The tremendously popular acceptance of her designs in towns as well as cities prove her knowledge.

As originator of stainless steel tableware she won national recognition. Again as stylist for dining car appointments of the famous Burlington Zephyr she won the tribute of style authorities as well as the public.

Now she scores again with the 1935 Hotpoint Electric Ranges. Their beauty of style and simplicity of line assure a new charm for modern kitchens. Experts say that the "eye appeal" of the newly styled Hotpoint ranges will give a great impetus to range sales.

THE RANGE SCOOP

THE MARVEL

LIST PRICE

$79.50

★ Here is a new table-top range that should make nation-wide electric cookery an accepted fact. The Marvel—a big 39 inch long, 3-unit range with full 16 inch oven—gives full capacity at a startlingly low price. It has top and bottom oven units, is sturdily built and opens up an entirely new market for electric cookery.

The Marvel is offered with the assurance that it will perform according to Hotpoint's high standards. This is the lowest priced range ever offered with such capacity, style and Hotpoint's popular features.

BRIEF SPECIFICATIONS

Unusually rigid body of steel welded in one piece; new 2-heat lever action load-balancing switches; new accurate hydraulic-type oven temperature control with pilot light on switch panel; both oven heating units controlled by one switch. Broiler pan, drip tray, appliance outlet. Finish: cooking top—white stainless porcelain enamel; front panels—all white porcelain; end panels and frame finished with Silver Lustre baked-on Glyptal enamel.

Hotpoint

OF THE YEAR ★ ★ ★

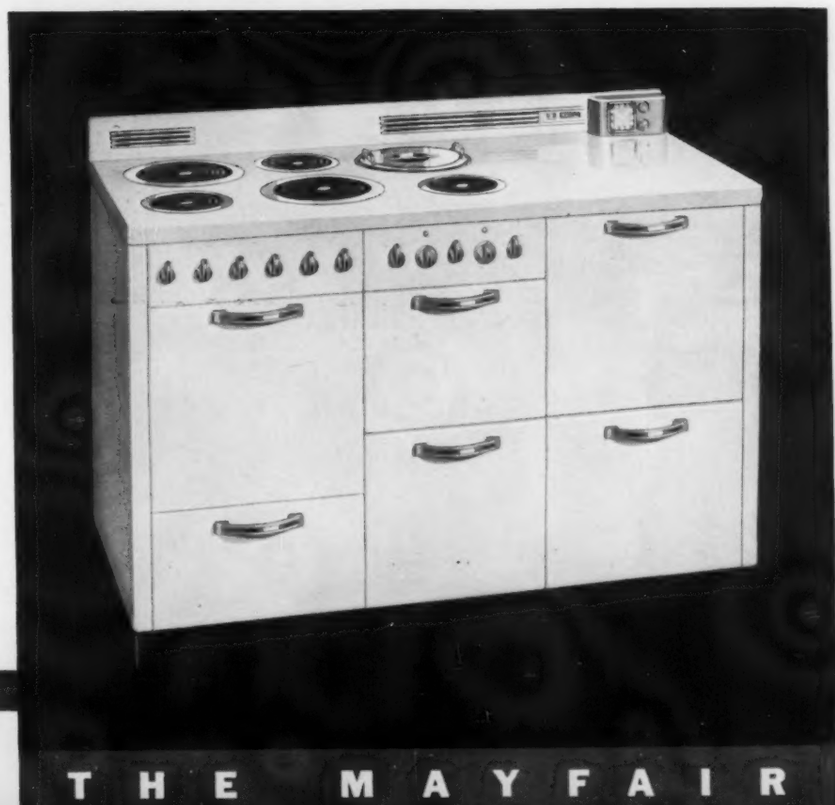
THE TREASURE

★ The new **TREASURE** (illustrated at left)—a beautiful table-top range, conforms to the modern styling of built-in kitchens.

In addition to Hi-Speed Calrod cooking coils, the Treasure offers: choice of white or ivory porcelain enamel with smart chromium trim; working surface of stainless porcelain; new, accurate hydraulic-type oven temperature control with dial regulator and pilot light on switch panel; over-size oven, heavily insulated; appliance outlet; timer receptacle; large storage drawer with lock-stop; new 2-heat lever action load-balancing switches.

* * *

At the left (below) is illustrated the new **MAYFAIR**—a beautiful 6-unit, 2-oven de luxe range styled by Helen Hughes Dulany. This model will be in production about June 1, 1935.



THE MAYFAIR

PROVED AND IMPROVED

THE NEW CENTURY

This beautifully styled cabinet range is intended for those customers who prefer the conventional type of range—but who still appreciate modern styling. It is typical of Hotpoint economy (with the Thrift Cooker) Speed (with Hi-Speed Calrod) and beauty as the result of Mrs. Helen Dulany's expert styling.

★ With the new 1935 Hotpoint electric ranges comes another step in simplifying electric cookery—the two-way lever switch. Hotpoint has proved by three years of field tests that "high" and "low" are the only two speeds necessary for successful electric cookery—so the new ranges embody this feature as well as a new, improved oven temperature control.

Calrod, which offers *all* the speed necessary for any cooking operation, is winning greater recognition this year than ever before. Calrod's amazing speed and durability do not slow up with age. Accelerated life tests indicate an average age of 7½ years. This means satisfied customers and freedom from service.

It has been said by utility men that the speed, durability and economy of Calrod, are the greatest factors in the success of the electric range business.

Hotpoint offers MORE than merely ranges

Hotpoint gives you not only superior products, but in 1935 Hotpoint is carrying the dramatic story of "Miracle Cookery" to millions of women every month in their favorite national magazines. Beyond that, Hotpoint provides you with trained range specialists to help plan and organize your activities to get the best results from your range campaign efforts. Home economists, skilled in the art of demonstrating electric cookery, are at your command. Hotpoint's News Bureau will furnish stories and facts which your local news editors will gladly accept.

Ask today about Hotpoint's Year-'Round program.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc., 5600 West Taylor Street, Chicago

ELECTRICAL WEST

[*Devoted to the economic production, transmission and distribution of electric power and its application to industry, commerce and the home in the Pacific Empire, and to the sale and distribution of electrical utilization devices, equipment and appliances in that area*]

March 1935

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Human Nature—a Puzzle

By H. A. LEMMON

Commercial Manager, Sierra Pacific Power Co., Reno

First of a series of four articles dealing with human beings and their attitude toward the electrical industry, by a man of many years contact, knowledge and experience in dealing with people.
—The Editor.

ON a gentle slope leading to the foothills sprawls the college. It emits a benign and possessive atmosphere over its part of the city. Blocks of homes occupied by those having to do with its affairs, and with professional people, conservative people—a little world in itself—self-contained, self-sufficient, indifferent, rather aloof; an environment of calm culture; a community within a community.

On the Heights at the western edge of the city seem to have gathered most of those who feel that they constitute the "Social Stratum." Confident that in fact they are the "Best People", they fling the challenge of supremacy to those benighted citizens elsewhere, whose retort is merely a grin of tolerance and quizzical amusement. The Heights is the bootleggers' paradise. It quivers with excitement at first hand information of the recently-arrived movie divorcee. Intelligence runs from a minimum interest in things to a maximum interest in people. The Heights is absorbed in little things about little people, including themselves. It seriously and zealously nurtures its illusion of grandeur. No, the Heights is not an important part of the city.

Across, to the East, are included the people of the "Jungles". Some of them are squatters who have put together all sorts of odds and ends in which they live. The Government Relief Depots are nearby. Then come the tiny two-room cottages and the three and four-room homes, occupied by people whom the world has dealt not too kindly. They are very earnest—good citizens on the whole. They are quite enthsuiastic about the Townsend Plan; don't care as much for the New Deal as they did. Many of them lost their jobs as soon as election was over, and the votes counted. Not a force likely to turn the tide of events!

The Southern section of the city is made up almost entirely of small homes, some of them owned by their occupants. There are many trees, although not as many as on the Heights, and flower gardens which receive much loving care. Occasionally the family washing appears along the house or in its rear. Early in the morning husbands are holding the hose, sprinkling the flowers and the lawns, while their wives are preparing breakfast. That is, they do this until the boy arrives with the morning paper; then they disappear, and the next we see of them they are fully garbed and on their way to the day's work. No servants, no professional gardners, but children by the hundreds and dogs by myriads.

When speeding cars along the Washington and J Streets' intersection fail by the fraction of a minute to maintain their orderly course, there is a crash. Almost instantly, and certainly before the echo has stilled, nine youngsters and six dogs will have arrived to observe and to give advice. A moment later come the mothers, some seemingly just on their way to afternoon tea, and others who surely were interrupted as they were about to enter the bath. At the end of four minutes the women, having exhausted the high lights of the accident, exchange comments about one another's gardens, with a dash of trifling neighborhood gossip, only to be diverted by a dog fight—not two dogs but half a dozen and a half hundred boys and girls, large and small, dive into the melee to rescue or to urge to greater effort their canine proteges or companions.

THE 300 and 500 blocks, inclusive, on Washington Avenue embrace the homes and families of a successful clothing merchant, the owner of a large laundry, a shoe merchant, a piano instructor, a fireman, a butcher (who also is a Communist), a garage owner, a traveling salesman, the telegraph editor of a newspaper a postal employee, three laborers, an insurance agent and a telephone official. Two of the homes are being remodeled by Government agencies, and all are in good repair, and attractive.

When evening comes, it is as though some impish and venturesome spirit,

irked by discipline, stirs his palette into a riot of impossible and experimental hues. The white fluff of lazy clouds is magically touched with a tentative pink, followed by a rapid and sure progression through a gamut of flamboyant scarlets. Then the splendor of gold and burnished copper bathes all Nature with a weird and eerie effulgence. Next, as thought frightened at its immodest boldness, but still with reluctance, the gorgeous carnival of color changes to gray, and the sheen of the mountains imperceptibly but quickly dissolves into purple mystery. The lights begin to twinkle in the windows, and darkness is over the land. Radios are sounding inside, and there is the soft glow of cigarettes and pipes on the porches. The day is closing. This, the real Americana, the part of Americana which counts, which decides the course of governments and of human activities. Homes that are homes—not sleeping places.

Among the men will be found representatives of the Rotary, Kiwanis and Lions Clubs, of the Chamber of Commerce, the Automobile Association, the Retail Merchants' Association, the Audubon Society, and all of the churches, and at least three of the Labor Unions. Some of them are leaders, and some are of those who constitute that dues-paying group known as "Wheel Horses", but so necessary as a foundation for more ambitious activities.

As is true of the men, so it is of the women. Some of them are prominent in church circles, in auxiliary activities, the Women's Forum, the Century Club, the Parent-Teachers' Association, the W.C.T.U., the Garden Club, and others. Good citizens, good friends, good neighbors. Honest and genuine hearts full of sympathy for the afflicted, souls full of joy at news of good fortune. Destroyers of property of others? Inflict an injuctice or injury on any man? Unthinkable! A cross section of all that is typical, all that is best, and some of what is worst in American life—that greatest work of God—the average citizen.

THE electric utility serving this community is well managed, measured by any generally accepted yardstick. It is rendering splendid service, has been more than liberal in its contributions of money and talent to civic welfare. It is carrying hundreds of people on its books whom the depression hit, and does so with no hopeful expectations. It cuts out no service solely because of poverty or misfortune. It upholds the best ideals of the great service industry of which it is a part. It is a good citizen, not solely as a corporation, but also because of the character of the individual units comprising its structure. Its rates are reasonable, the collected return on its investment moderate.

OF the fifteen families in the three blocks on Washington Avenue, ten signed a petition demanding municipal ownership of electric utilities. Three declined. One, the laundryman, because of his personal friendship for some of the officials of the company; the piano teacher because he had taught piano to the wife of another when she was a little girl; the third because he is a minor official of the telephone company.

Of the neighbors, one is a very estimable lady who was widowed several years ago. The husband and father was killed in an accident on the railroad on which he worked, leaving only an estate consisting of three small children. In some manner known only to mothers, she succeeded in keeping her little family together, putting them through high cshool, until finally now they are employed and earning enough to care for the mother approaching the end of her eventful journey. For all of these years — fifteen, to be exact — the power company has furnished that little family with electric and water service without any cost whatsoever. Just a soulless corporation's tribute to heroism and competent motherhood! All three of these children signed the petition.

NOW, of course, if the utility had a soul it might be justified in feeling bewildered. It might even retire behind its wounded dignity. Perhaps it might be pardoned if sometimes it felt that the good things it has done are not appreciated, or even noted. It might consider eliminating some of its civic work, abandon its efforts to measure up to constructive citizenship. And it might even go so far (secretly and confidentially) as to feel that the people could go plum to hell.

But they won't go—there, or any other place. They will be right here long after the utility has disintegrated. Utilities may rise and fall, be built and destroyed; but so long as the earth continues to revolve, the people will be there. In mass, their nature never changes. Seemingly if we expect to continue to abide with them, *we* will have to do the changing. There are no other people—and never have been any other people—to serve. So perhaps, however complex and incomprehensible their mass characteristics may seem to be, their failings or their inconsistencies, the unalterable fact remains that *they are the people*, and the *only people* there are with whom to do business.

IT seems absurd (but this is an age of absurdities) that we really can't alter the world, which so needs altering, to meet our own superior standards and to conform to what we know is right, and that, content or not, if we expect to survive, we shall have to take it as it is.

Is it, can it be possible, that after all the people are right and that the trouble is with us?

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Letters...

TO THE EDITOR:

The series of articles and papers published in your December issue in connection with the P.C.E.A. prize contest, is arousing thought and keen interest among students.

May I submit for comment and criticism a suggestion of a possible line of advance in electrical practice?

The present rapid growth in the use of household appliances requiring motors, and the promised phenomenal growth in new forms of such devices—air-conditioning offering, for example, an unlimited field in which small motors will be used—emphasizes the desirability of three-phase current in houses.

An objection to such three-phase distribution is the impossibility of balancing the load. Three-phase motors form a balanced load, but lighting does not.

The suggestion I offer is that a three-phase tungsten filament lamp should be developed having a star or delta connected filament. The design of a suitable snap switch would call for some ingenuity, but it need be only a two-pole switch. The following would be some of the advantages of such a lamp:

1. It would form a balanced three-phase load,

2. It would eliminate flicker even at very low frequency,

3. Sudden death of a filament would be avoided, since, probably only one limb of the filament would burn out at once.

4. I suggest that there might be a rotation of the boiled-off particles of the filament producing a concentrated upward current of particles tending to the formation of a deposit upon the top of the bulb, where its capacity would be of least importance. In this way the useful life of the lamp would be increased.

F. M. DENTON,
Head of Electrical Engineering Dept.,
University of New Mexico.
Albuquerque, N. M.

Who Is Too Poor?

IT'S about time to blow up a new theory that is creeping into the industry's consciousness. It goes something like this: "What's the use of having low rates if the consumer can't afford to buy the appliances to use the current? When you ask a consumer to buy a range and a refrigerator and a water heater, you're expecting him to invest more than the power company did in lines and service. He can't afford to do that." Maybe he can't but he did. One million, three hundred thousand of him bought electrical refrigerators last year. And several thousand bought ranges and water heaters right here in the Golden West.

This new theory may have some substance in the Tennessee Valley where the annual income is pretty low, but don't let it get started out here. The price of a V-8 will buy enough electrical equipment to start anyone on the road to happiness; it can be paid for on the familiar down-and-monthly plan and it will still be going strong after the car has made three trips to the trading lot.

From the beginning, our industry has been cursed with this inferiority complex. People would buy Steinways and Buicks and Hamiltons and stay at the Biltmore, Olympic or Palace and go to the big game, but they wouldn't pay over three dollars for a toaster. At least that's what we thought until someone came along with a toaster in the Steinway class and it became a best seller at $12.00. There are plenty of homes that can afford to spend a few hundred dollars to modernize the kitchen but they won't do it so long as we stand around and say, either by word or example, "That's O.K., lady, but it's pretty expensive." Shades of J. Rufus Wallingford!

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LEST it be suspected that Electra's husband perpetually inhabits the sunset side of the hill, hearken to a few kind words about the San Diego exposition which will make its bow on May 25. This show is a natural. It rests in a ready-made setting. It is big enough to be adequate and it's compact enough to be visible. People from the eleven western states will flock to it; don't let anyone tell you otherwise. Our folks out here in the west are going to have a little more money this year, they're just itching for a vacation and San Diego's fair is a nice excuse to make the trip and include Rainier, the Redwood Highway, Yosemite, Hollywood and way points.

The electrical industry will not have a better medium for telling its story in 1935 than is offered by the San Diego fair. The whole theme of the exposition is the new era in the west where mighty projects are approaching completion. Chief of these is Boulder Dam and that is synonymous with electricity. Folks just naturally will be thinking about what this means to them and they will be interested in all the electrical gadgets in the catalog. Better get ready to make a fine exhibit at San Diego, and give Electra's husband credit for a good sales talk.

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ELECTRA is sore at the folks who design incandescent lamps. Two or three years ago she was given a beautiful floor lamp whose socket is buried deep in a cast bronze throat. It uses a 75 watt lamp. A smaller lamp would not reach the contacts and a larger one was too fat to fit the throat. Now the 75 watt lamp has been changed so that it is too fat to fit and the beautiful floor lamp threatens to become a museum piece.

Years ago we went all over this ground, standardizing the dozens of floor plugs and fittings that had been evolved from American inventive genius. I thought everything was fixed only to discover that some designing engineer had decided to change the shape of a bulb. Maybe we can find a Japanese lamp that will do the trick.

•

ONE of the industry's elder statesmen has concocted a story which is so good that it can no longer be withheld from print. It was inspired by the frequent statement in Washington dispatches that the President was hopeful for a return of business confidence. The author must remain anonymous until he is willing to recognize his masterpiece. Here it is:

About forty years ago, in the heyday of the mellerdrammer, there was a popular show called "Nellie the Beautiful Cloak Model." In the first act the villain pushed Nellie over the edge of a cliff, but the hero happened to be passing that way and he saved her from destruction. In the second act the villain tied Nellie to the railroad track just as the Limited was due, and again the hero arrived in time to save her. In the third act the villain shoved Nellie off the Brooklyn Bridge, but the hero was conveniently near in a tug boat. In the fourth act the villain tied Nellie securely to the carrier table in a saw-mill and again the hero arrived just as the whirring saw approached her helpless form. Soon after this episode the villain and Nellie met in the lane and he asked her, in his most plaintive manner, "Nellie, why do you distrust me?"

•

WELL, the first chapter of the Federal Power Commission's rate survey is out and the West has fared rather well. It appears that the Big, Bad Power Trust hasn't been exploiting the widows and orphans so terribly after all. To Electra's husband, it is quite apparent that the utilities on the Coast, operating under economic laws, for years have been working out practical rate structures without the help of any academic and alphabetical agencies and that the more abundant life was attained in the west quite some time before the great phrase-maker and fireside chatter assumed his sables and scepter.

One point which was not mentioned in the F.P.C.'s report and probably will not be included in future chapters is this: Rural consumers throughout the west enjoy electrical rates only slightly higher than those of Pacific metropolitan centers and comparing favorably with any rates, anywhere, in the United States.

And, speaking of taxes, Electra's husband is getting rather fed up on the alibis emanating from these state capitals. "If you want your taxes lowered, get in touch with your assemblyman and senator. They are willing to do whatever their constituents want. We can't do anything until the people become tax conscious." How can one sane person expect another sane person to believe anything like that! Our legislators know perfectly well what their constituents want. They want some semblance of economy in our State governments.

If the people are not tax conscious I'll eat a fuse plug.

Engineering Symposium + + +

[*A monthly forum in which engineers will present and discuss their problems, this department is dedicated to advancing the art of power generation, transmission, distribution and utilization*]

Practical Application of Sequence Metering

By A. D. IRION
Test Engineer, Southern California Edison Co., Ltd.

A Description of Developments by the Meter Department of the Southern California Edison Co. Which Culminated in a New Practice Permitting the Use of Old and New Equipment for the New Sequence.

FOR many years past the Southern California Edison Co., Ltd., has been pioneers in the field of outdoor secondary installations. Along with the many obvious advantages of outdoor metering such as ease of reading, accessibility for testing, initial cost, and improved public relations, the problem of current diversion remained to a large extent, unsolved. It was apparent that reversing the sequence of connections of the meter and service switch discourages tampering and current diversion, especially on the outdoor type of meter installations.

With this advantage of new sequence in mind, extensive tests were carried on in the company's test laboratory for many months on typical installations to determine definitely the strength or weakness of the watthour meter with relation to other parts of the consumer's service, such as the wiring, switch, etc. Practically every type of service meter was placed under the same conditions of short circuit. The newer type of meter having an obvious advantage over the older types. One stock 5-amp. meter carried 3800 per cent load or 190 amp. for 30 minutes without opening the circuit. Needless to say the meter was damaged, but aside from a current coil whose turns had welded together, the meter was by no means beyond repair.

Without question of doubt, the results of these tests played an important part in the adoption of the revisions of the National Electric Code effective November 1, 1931. Since the code approval of the new meter sequence, the company has energetically and effectively evolved standards for practically every type of installation for any type of meter whether it be new or old.

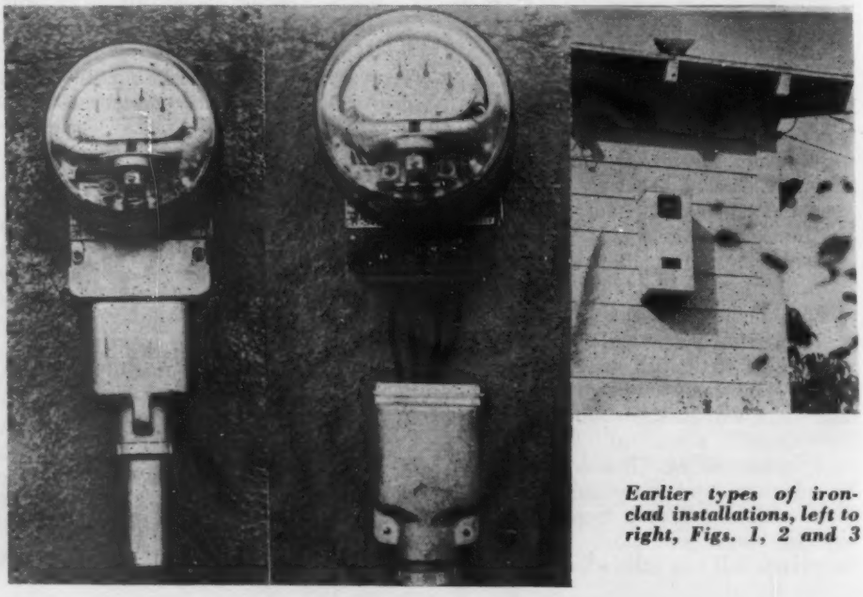
The process of formulating standards adapting old equipment to more modern use was gradual and the present practice of the company clearly shows the evolution which has taken place. In working out the solution certain facts were fundamental. Three general types of installations were in use on the system for single phase service: (a) outdoor installations; (b) indoor installations and (c) recessed installations.

Also the solution had to embrace the following factors:

1. The installation must be as theftproof as is practicable.
2. The cost both to company and consumer must be kept to a reasonable minimum.
3. The stock of metering equipment must be kept as small as possible.
4. Present equipment, both in stock and that returned from the line, must continue to be used for further service.
5. Standards of installation must be such that any type of new or old equipment can be used interchangeably.
6. All standards of codes and various local ordinances must be taken into consideration and rigidly followed.

The accompanying pictures illustrate the application of both new and old equipment to new sequence. Some of the installations of two years ago now appearing obsolete, remain fundamentally unchanged and still permit flexibility in application to present day standards.

Fig. 1 represents one of the first ironclad outdoor installations to be used. Although obsolete now, it was an initial step in the application of a fixture to conceal wiring and yet permit easy access to the meter terminal chamber. Fig. 2 shows the fixture in the lowered

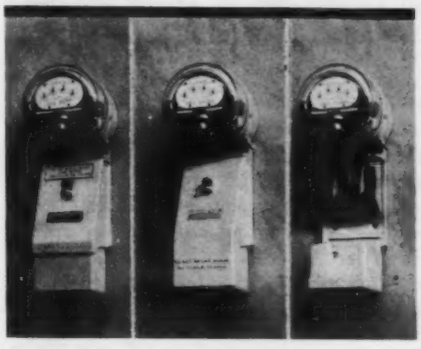


Earlier types of ironclad installations, left to right, Figs. 1, 2 and 3

position permitting a cut-in for testing purposes.

Fig. 3 shows the first type of enclosure that could be used for a complete new sequence installation. Generally speaking, the box or cabinet is similar to many boxes of this type in current manufacture with added features of four concentric knockouts on both sides and back and increased dimensions to accommodate every type of indoor meter in use on the system. A 4-pole safety block of the sliding link type was installed in every box for testing and disconnecting purposes. This type of installation became obsolete when an outdoor-type, new sequence meter was developed representing cheaper overall cost and with other developments which gradually materialized and which will be described later.

Fig. 4 represents the first complete outdoor new sequence meter used on the system. The base and cover were of sand cast aluminum alloy equipped

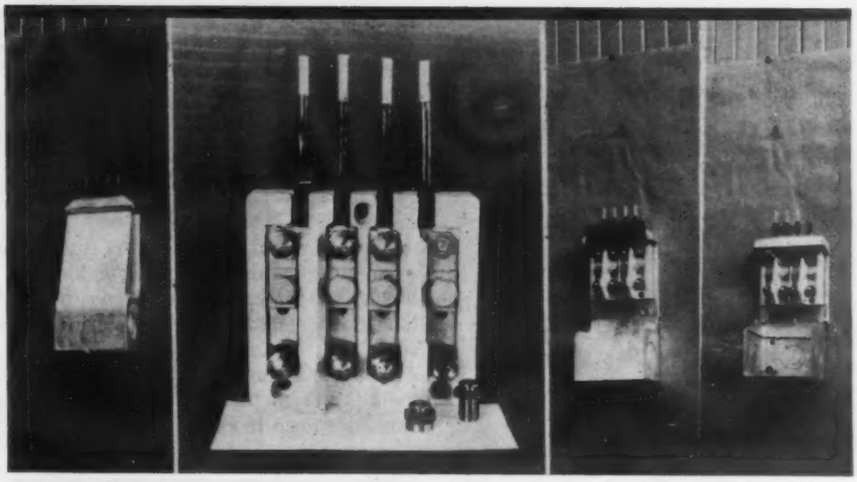


Initial installations incorporating the new sequence, left to right, Figs. 4, 5 and 6

with a 4-pole safety block. The pull box with four concentric knockouts on sides, back and bottom permitted interchangeable use with the box of Fig. 3. The pull box was of galvanized steel, finished in the same color to harmonize with the meter itself. Fig. 5 represents the improved meter described by Fig. 4.

Fig. 6 shows the meter with the terminal cover removed. The pull box remained the same except the front was cut away to facilitate the pulling in of the service wires. Grooves were provided in the cover to give the meter additional protection to the weather.

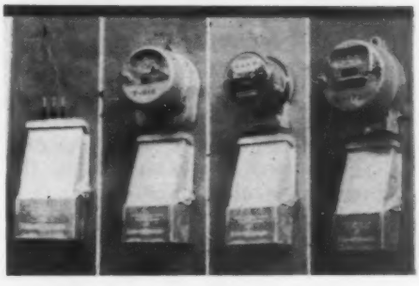
Fig. 7 shows the next step—an adapter essentially the same in design as the lower part of the new sequence except that the pull box was die-cast as an integral part of the base. Four concentric knockouts were provided and extensive tests made to prove that die-cast knockouts were both feasible and superior to the conventional type of stamped knockouts. The perfection of this feature represented a marked advancement in the application of new sequence metering. The entire adapter was designed by the company. The 4-pole test block was redesigned to company specifications. Barriers were reenforced; solderless connectors of company design were supplied; improved facilities for test leads were also supplied and the mechanical design of the solderless connector was ample to accommodate a No. 2 conductor.



Evolution of adapters with company-designed test block, left to right, Figs. 7, 8, 9 and 10

Laboratory tests indicated that the block was capable of carrying 250 amp. for 5-min. periods without overheating or any damage whatsoever resulting to the block. Stops were provided for each solderless connector so that no conductor could in any way interfere with the operation of a sliding test link.

Fig. 8 shows a close-up of the test block. The projecting prongs are punched from copper and have an area equivalent to a No. 6 conductor. Each prong is annealed to facilitate connections to the various size terminal chambers of different makes of meters. It will be noted that the prong from the top end to the test link is of one piece, eliminating one extra joint of connection. Connections are tightened by means of a socket wrench, insuring positive contact. Fig. 9 is the same adapter of Fig. 7 with cover removed.



Latest design showing application to new and old meters, left to right, Figs. 12, 13, 14 and 15

Fig. 11—Installation of sequence meter between studding

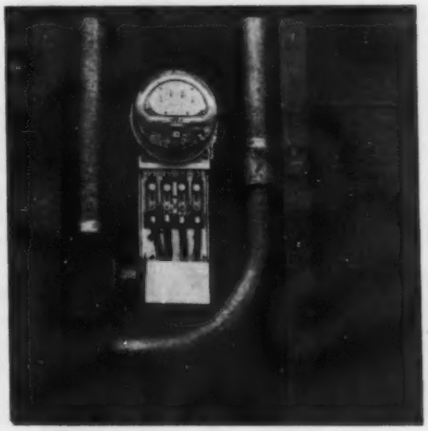


Fig. 10 illustrates the same type of adapter with the pull box being a separate piece and resulting in an overall reduction in length of approximately 1¼ in. This modification in design was to permit flexibility in application to any one of types of installations shown on the specification sheet for single phase 115/230-volt service, 100 amp. or less. This design also allowed interchangeability on the recent meter manufacturers' developments of Types "A," "B" and "S" meters.

It can be readily seen that the contractor is given a choice of supplying either a meter loop pull box or approved fitting of the T type. It should also be noted that a special pull box 4 in. x 4 in. x 9 in. can be used for the recessed installation when desirable.

Fig. 11 represents such an installation when No. 2 conductors are used on a recessed installation between studdings 6-in. between centers. Fig. 12 represents the latest design showing the slight changes in sealing arrangements necessary to permit the use of the die

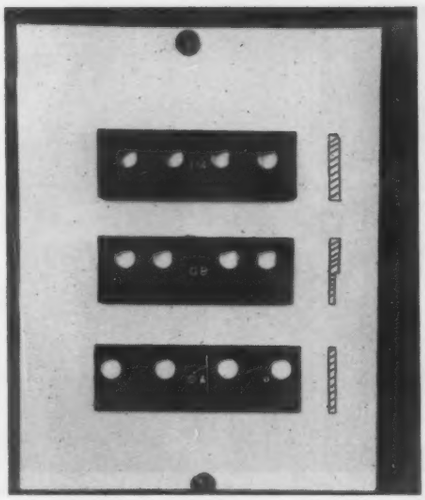


Fig. 16—Bakelite spacer blocks to permit use of older meters with new sequence

cast pull box which has been jointly standardized by four of the meter manufacturers in their new sequence developments.

The application of the adapter to both new and older types of meters of different manufacture is depicted in Figs. 13, 14, and 15. Due to the various spacings of the terminals in the older types of meters and also due to the different types of terminal bushings it was obvious that some inexpensive means of obscuring and protecting the prongs of the adapter at point of entrance to the meter terminal chamber would be necessary. This was solved by designing "spauldite" spacer blocks properly drilled for three of the most common types of meters in use on the system. Each type of block is stamped with the type of meter for which it is to be used. The application of these blocks immediately permitted approximately 375,000 meters to be used with new sequence but only a small percentage for outdoor new sequence installation.

Fig. 16 shows details of these bakelite filler blocks and details of cross-section. In order that these indoor-type meters could be used both outdoor and new sequence, the die cast base and glass cover of company design shown in Fig. 17 was developed. Fig. 18 represents a rebuilt outdoor installation employing the adapter and die cast housing of Fig. 17.

Figs. 13, 14 and 15 show the complete protection afforded by the spacer blocks on three different types of meters. As stated before, these can be readily made outdoor by omitting the spacer blocks and inserting the top of the adapter to the base of the die cast housing shown in Fig. 17 and illustrated by Fig. 18. The improvement in appearance over the cabinet or box shown by Fig. 3 is apparent and the overall cost to the company is approximately the same.

Fig. 17—Die-cast base and glass cover designed to permit outdoor installations of older type meters

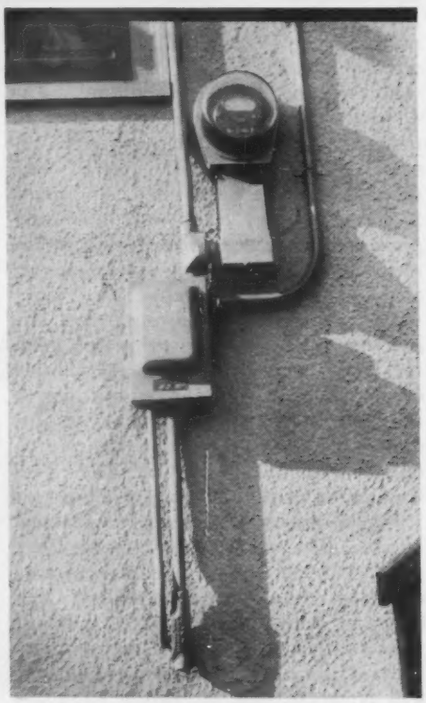
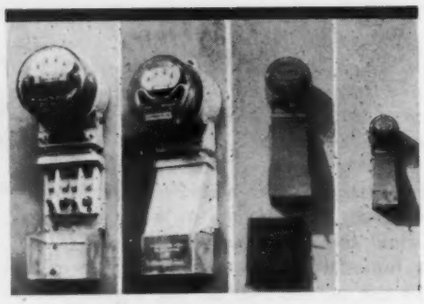


Fig. 18—Rebuilt outdoor installation employing new sequence

Fig. 19 represents a modern type, outdoor meter and adapter for complete new sequence. No spacer block is necessary on this type of installation as the design of the terminal chamber projection is such as to give complete weatherproof protection. This also applies to Fig. 20 which represents a modern meter of different manufacture but equally weatherproof in terminal chamber design.

Figs. 21 and 22 illustrate a complete new sequence outdoor installation employing the standard adapter and an ordinary type of outdoor meter of recent design. In many communities a local ordinance requires the service switch to be mounted on the outside of the dwelling and Fig. 21 shows such an application.



Typical arrangements of outdoor installations employing new meters, left to right, Figs. 19, 20, 21 and 22

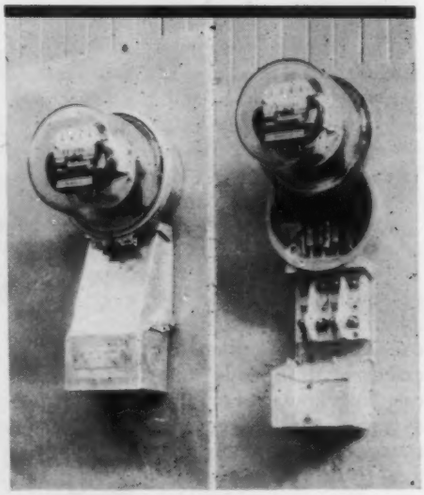
Fig. 23 shows the application of the adapter to one of the newest types of meters now in production. Slight modification to the die cast bases was made to accommodate the adapter and make the installation thoroughly weatherproof. No changes were made to any internal parts of the standard meters.

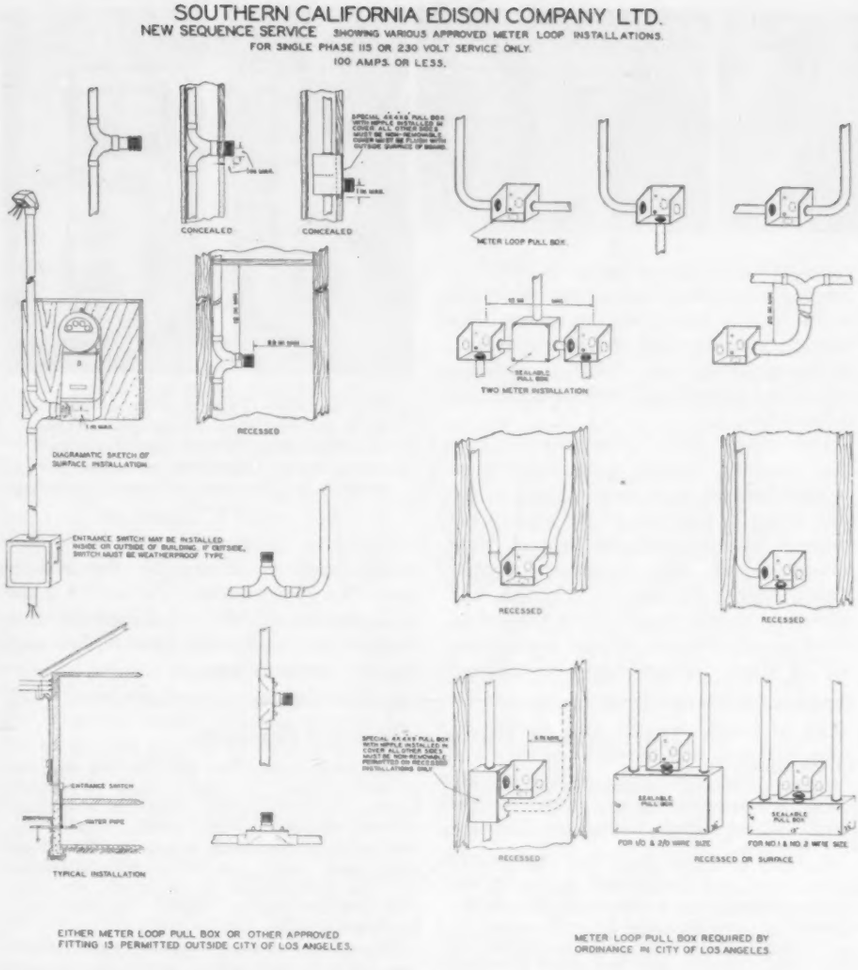
Fig. 24 shows the meter in position at time of installation to allow connection of the adapter prongs to the terminal block. This would also be the position of the meter at time tests were made. The sealing studs of the meter itself are at the back. This feature, continuing the practice established by the company that access to the meter itself is not necessary for placing the meter in, or removing it from, service.

Several features incorporated in the above standardization should be stressed:

1. The standards for installation by the contractor are simple and inexpensive.

Adapter applied to very latest type of meter, left to right, Figs. 23 and 24




SOUTHERN CALIFORNIA EDISON COMPANY LTD.
NEW SEQUENCE SERVICE SHOWING VARIOUS APPROVED METER LOOP INSTALLATIONS.
FOR SINGLE PHASE 115 OR 230 VOLT SERVICE ONLY.
100 AMPS. OR LESS.
CONCEALED
CONCEALED
METER LOOP PULL BOX
TWO METER INSTALLATION
RECESSED
DIAGRAMATIC SKETCH OF SURFACE INSTALLATION
ENTRANCE SWITCH MAY BE INSTALLED INSIDE OR OUTSIDE OF BUILDING. IF OUTSIDE, SWITCH MUST BE WEATHERPROOF TYPE.
RECESSED
RECESSED
ENTRANCE SWITCH
WATER PIPE
TYPICAL INSTALLATION
RECESSED
FOR 1/0 & 2/0 WIRE SIZE
FOR NO.1 & NO.2 WIRE SIZE
RECESSED OR SURFACE
EITHER METER LOOP PULL BOX OR OTHER APPROVED FITTING IS PERMITTED OUTSIDE CITY OF LOS ANGELES.
METER LOOP PULL BOX REQUIRED BY ORDINANCE IN CITY OF LOS ANGELES.
SPECIAL NOTE — CONDUIT SYSTEM MUST BE GROUNDED AND GROUNDS MUST BE INSTALLED IN ACCORDANCE WITH CODE.
CONSULT YOUR ELECTRICAL CONTRACTOR.

Approved meter loop installations for new sequence service are detailed on drawings of this type for use by electrical contractors

2. Any meter from the newest type to those of fifteen years ago are readily adapted to outdoor new sequence at a minimum cost.

3. Meter stocks are not increased, but greater flexibility has resulted in the number of combinations which are possible with existing stocks of meters.

4. No special test equipment, jacks or adapters, of any kind are necessary to test any type of new or old sequence installation. This results in increased efficiency in the routine testing of approximately 450,000 meters and also eliminating interruptions of service at time of test.

To date, approximately 20,000 new sequence installations are in service on this character of service. Although no installation is 100 per cent tamperproof, any tampering on this type of installation is readily discerned, usually with unquestionable evidence.

In ease of installation, in saving of the meter reader's time, and in the prevention of energy diversion, the metal clad installation is highly desirable. Future saving will be large for those utilities that have undertaken a program of new sequence metering.

●

Anaheim Modernizes Distribution System

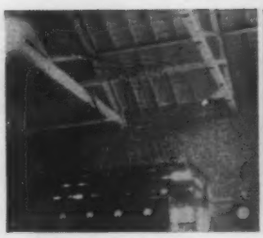
By V. W. HANNUM
Superintendent, Municipal Light & Power Dept., City of Anaheim, California

TAKING advantage of the opportunity for federal financial assistance under the Public Works Administration, the city of Anaheim recently completed a $50,000 modernization program for its distribution system. For some time the system had been sorely in need of a thorough rehabilitation, the most prominent symptoms of which was poor regulation and crowded overhead structures. Efficiency was relatively low as might be expected from any system that has been built up in a piecemeal fashion over a long period of years. Aside from the better operating conditions that might be expected after rebuilding the system, the project undertaken at the time employed an average of 28 men for 35 weeks which improved employment in the locality.

Briefly, the modernization consisted of replacing a long antiquated installation of overhead circuits formerly used in getting away from the plant with a modern system of underground feeders running from the main switchboard approximately 250 lin. ft. to the main distribution manhole and then up primary distribution risers to the overhead circuits. The underground system consisted of ducts containing eight 4/0, 3-conductor, lead-covered, 5,000-volt cables feeding lighting and power circuits together with three No. 2 3-conductor, lead-covered, 5,000-volt cables, two of which were for street light primaries and the other for power. To improve voltage conditions, two new 48-kva., single-phase induction voltage regulators were installed at the plant for bus regulation.

The eleven new primary feeders installed in the modernization were rerouted in such a manner as to keep the transformer banks as near as possible to the load center. In preparing the plant's estimates for the modernization, the city was sectionalized with a division assigned for each new primary circuit. Voltage was retained at 2,300 volts delta but the modernization was

Fig. 1. Left—Getaway structure at the plant before the modernization. Center — Improved appearance of the plant after modernizing by placing outgoing circuits underground. Right—Primary risers feeding the eleven new primary feeder circuits installed in Anaheim modernization program



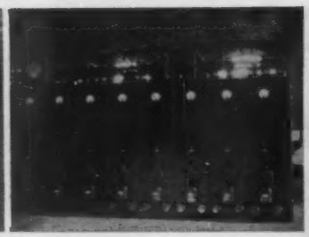
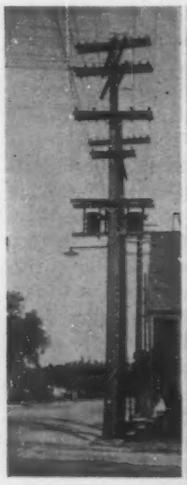


Fig. 2. Outgoing feeder circuits from the plant switchboard before modernization. Right—Switchboard after feeder circuits had been placed underground

made with the idea of changing to 4,000 volts "Y" at some future time. Larger copper was installed in practically all of the new circuits and circuits were routed so that each circuit would have minimum resistance as far as length, construction and service conditions would permit. A general recheck of load centers was made and new transformer banks set accordingly so that at the present time there are practically no instances where load centers are not supplied with adequate transformer



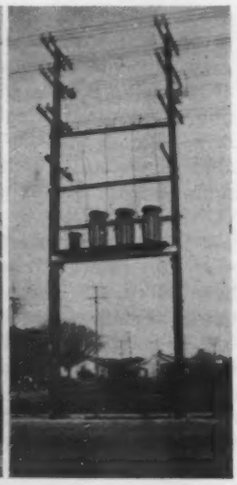


Fig. 3. Left—Before the reconstruction of overhead circuits, power transformer banks looked like this. Right—After the modernization the overhead circuits looked like this

capacity capable of handling anticipated load increases over an appreciable length of time.

The secondary system was carefully surveyed and changes in wire sizes recommended wherever necessary. In this connection ample provision was made for results of future load-building programs which might be undertaken by the department. The project was carried on with a minimum of service interruptions to consumers because new circuits were constructed over the existing line and service cut over after the construction was completed.

Although the project has been completed only a short time, there have been advantages apparent already from the change. Maintenance costs have naturally decreased. Due to the installation of new copper and the re-arrangement of transformer banks in the load centers, there has been appreciable rise in the power factor on the system as a whole, thus lowering the losses as well as the wholesale cost of energy which is purchased from the Southern California Edison Co., Ltd.

Operations have been improved in that working hours, previously spent in maintenance, now can be used in the rebuilding of portions of the system not covered by this particular project. Most important of all, increased copper areas, better division of circuits and improved power factor have helped to bring about efficient voltage regulation. All of these factors have contributed to the savings shown by the system since the changeover. From the public's standpoint the rehabilitation has reduced the chance of breakdowns and service interruptions.

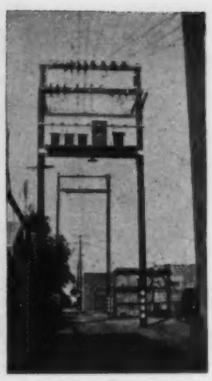


Fig. 4. Left—Typical alley construction before modernization. Right H-frame distribution structure and transformer platform adopted for certain of the new primary feeder circuits

More About Uncle's Grocery Business

To the editor:

I have noted with considerable interest the article in yours of January, 1935, by Bill Jones, entitled, "Uncle Going Into The Grocery Business."

The idea of Uncle going into the grocery business and making immense savings to the underprivileged man is entirely practical. The savings that can be made by such action by the federal government is understated by Bill Jones, however, and the order to which I belong has investigated his past and present history and can boldly state that he is trying to belittle the move, as we are confident that he has been bought up by the powerful Grocery Trust.

The organization that is going to put the real facts before the public is known as "Nature's Underprivileged—Take Supplies"—or, to be in keeping with the alphabetical times, called, for short, "Nuts to Everybody."

There are many abuses in the food distribution line. Take, for example, wheat from which bread is made. Wheat, corn and rye are sold by the farmer at prices ranging from ½ to probably 1½ cents per pound and when it is made into bread, it is sold by the "Grocery Trust" at an average price of about 10 cents per pound; in the form of cake, as high as 50 cents. See the possibility of the tremendous savings that can be made. Say the wheat costs 1½ cents and is sold at 10 cents as bread. Now the cost of converting the wheat into bread we have decided should not be over 1 cent, or a cost for a loaf of bread of 2½ cents. A saving on this one item can be made of 7½ cents, or 300 per cent, and not the paltry saving of 25 per cent as given by Bill Jones.

Take meats as another example. The farmer gets about 6 cents per pound for the best beef on foot. The cheapest price of meat you can buy from the butcher shop would probably be about 10 cents and some of the meat is sold for from 30 to 60 cents per pound. See what a saving we can make. We buy our meat for not over 6 cents and we sell it for not over 8 to 10 cents. Who says that our proposed plan will not be successful?

There are many other articles that are just as unreasonable: the pretty labels on canned goods, and advertising. There is absolutely no need of these colored labels. The pretty designs at times make a person buy things when they could get along without them. All that is necessary is to stamp the cans with a rubber stamp: "Pears", "Peaches", etc. See what a saving can be made.

Advertising! Does the postoffice advertise? You bet not—and neither would we, because we deal in necessities.

We have a fine committee investigating one point that we think is important. That is, why should the farmer get such a price for his product? He depends on rains or snow falling from the sky. This is a national resource and for the benefit of all. Why should we have to pay the farmer for using our resources? We think that the farmer should pay something for this and in that way reduce our expenses. We think it would about pay the cost of operating our stores.

Bill Jones does state it correctly when he says that we shall reduce the number of stores but we shall have bigger and better stores. We shall also cut the high salaries now paid to the managers or owners of such stores, who do nothing but complain about taxes, try to buy cheaper, get after their employees for idling, discourtesy or taking home supplies without paying for them. Anyway, if they do none of the above, they waste a lot of time at the Rotary meetings, the Y. M. C. A. and Red Cross drives, etc.

Some of our most prominent business men insist that our plan is "screwy", claiming that we have overlooked some items, but we insist that their statements are not to be depended on, for they are—as the attorneys say, "self-serving statements." Besides, they do not have the broad view of the situation because they are too close to the problem. They cannot see the forest on account of the trees.

We—I have to stop now, as they are ordering me to bed. We would like your application to our order.

Yours,

MARCUS AURELIUS.

Business Building Brainstorms + + +

[*What the Industry needs is a brainstorm to destroy the power surplus pest—Arthur Markwart, president, P.C.E.A.*]

Movie "Bank Night" Idea Might Sell Lighting

10 During the last few years probably no single factor is responsible for more loss in residential load than the increase in empty lamp sockets. Normally beautiful five-light fixtures hang gauntly, one lamped, like broken-mirrored dressers, in too many of the homes of today. That this state of affairs is inevitable with present economic conditions is hardly acceptable while football gate receipts maintain their high level. It seems more logical that we have failed as salesmen to popularize our product. Sales methods which have been balanced on the financial statement and proved by the slide rule appear to have been productive principally of reduced copper losses and greater rate complaints.

With the thought that we might profit by adopting sales methods similar to less distinguished businesses, methods which more closely follow changing public trends, the writer offers the following suggestion as an aggressive sales plan designed to quickly fill many empty lamp sockets. The idea, which to the extent of the writer's knowledge, is original only in its adaptation to utility load building, was prompted almost entirely by the present public mania for chance taking.

Each district office of the utility concerned will give a cash prize of $50 each week to a lucky consumer whose name or number is drawn during weekly district office drawings. All consumers within the district will be eligible to participate in the drawing providing they visit the office and assert their intention of complying with the requirements of the drawing. The drawing will take place publicly on a designated night and hour of each week. The participating consumers, instead of attending the drawing, will be expected to remain home during the drawing period. The lucky person will have delivered to their address immediately following the drawing, the cash prize which will be given to them providing they have complied with the provisions as stated below:

1—Some member of the family must be at home during the entire period of the drawing (for example, 10:30 to 11:00 o'clock, P.M., Friday).

2—Lights must be kept burning in the front rooms of the house during the drawing period.

3—All lamp sockets in permanently installed fixtures, must be found filled with good lamps and all switches and sockets must be in an operable condition.

4—The representative of the company making the delivery of the prize money, must be permitted to enter and satisfy himself that requirement No. 3, has been complied with.

If the winner has failed to comply with all the stipulated provisions, he forfeits his chance (an arrangement whereby he wins only a small part of the $50 might be more effective) and the $50 so forfeited, is added to next week's prize. This weekly increase may continue up to a limit thought best for the success of the plan at which time, successive names will be drawn until someone is found complying with the provisions of the drawing.

The utilities, with the assistance of lamp distributors, should be able to use the above as a basis for an effective sales campaign.—*Edw. M. McLaughlin.*

•

Industry-Owned Appliances Would Reduce Surplus

11 Electrical energy is generated with industry-owned generators, transmitted over industry-owned transmission lines, distributed over industry-owned distribution systems to the customers door, where it is metered with industry-owned meters. Why not carry this plan a step farther and consume this energy with industry-owned appliances such as ranges, water heaters and all appliances of a permanent or semi-permanent character?

I believe this plan would very nicely take care of your surplus power problem. At any rate it would take care of a large share of the industry's surplus. This, of course, would result in increased revenue which would soon pay the original cost plus installation and maintenance and after this cost was taken care of the industry would still enjoy this increased revenue.

There is nothing complicated, new or radical in this plan as our present electrical system was built upon it, that is, first installed and later paid for through revenue realized by the sale of electrical energy. Of course the appliances in this case would have to be covered by insurance to take care of loss by fire, theft, misuse and other forms of deterioration just as the electrical industry's present equipment is protected. —*Jack Darling.*

•

By-Product Plus Power Equals Dry Ice

12 It is said that no industry can be completely successful until a use is found for its by-products. Now the by-products of the electric utility companies may be considered to be off-peak power, and the present—truly the ever present—problem is to put this off-peak power to work.

Another by-product of a steam plant is carbon-dioxide gas. Combine the two and concentrated COLD in the form of dry ice can be produced. Manufactured cheaply enough and in large quantities many new uses would be found for this. A block of it in an ice box would last much longer than a cake of ice, would melt into a gas with no disposal problem, and would produce a much lower temperature. In fact with an insulating enclosure having an adjustable opening, the temperature could be regulated to suit. The saving in weight would be particularly advantageous in refrigerator cars and trucks. Quick freezing processes, creating an atmosphere of CO_2, and other uses can be suggested.

The present method of manufacturing dry ice in small quantities with pure gas would hardly apply in using flue gases which contain a large amount of water vapor and many other impurities, but it is felt that it would not be at all impossible to develop a practical process, and a pure product is not necessary for the uses suggested. In developing the plant it must be kept in mind that we wish to use off-peak power so it must be possible to shut down or at least idle for part of each day. Another advantage of locating such a plant adjacent to a steam plant is the large amount of cooling water

NOTE: For purposes of clarity and identification "Brainstorms" are to be numbered consecutively as published. Referring to the brainstorm published in the November, 1934, issue as No. 1, those appearing subsequently have been designated by number in the order of their appearance. Nine have been published prior to this issue.

necessary, which the steam plant would not be using at full capacity except during peak load.

Whether a carbon dioxide plant is run by the utility, by a subsidiary company, or by an entirely separate organization, it is felt that the advantages of locating it adjacent to a steam plant are too great to overlook, and that the future possibilities of dry ice are very great.—V.E.L.

•

Plan to Increase Highway Lighting

13 It is generally admitted that there is a large field for the use of electricity in lighting our highways, though little has been accomplished toward developing this market. The state authorities are spending large sums of money each year for improvements to our highways, but lighting is not yet one of these improvements. Naturally, the expenditures are made in a manner which will satisfy the demands of the motoring public as expressed through the automobile clubs, newspapers, and other interested organizations. Therefore, the problem is to create a demand for highway lighting through these channels.

To create a demand for anything, it is necessary to demonstrate its value. The value of highway lighting lies in the increased comfort, convenience and safety for motorists, and in economies for the state in reducing the cost of the highway patrol. To demonstrate this value most effectively, the utilities should install and operate the best lighting facilities on certain selected sections of the highways for a reasonable period of time at their own expense.

The state authorities could certainly be persuaded to cooperate to the extent of granting permits for these installations, with the understanding that they would not be incurring any obligation. Cooperation from the manufacturers of the equipment could probably be obtained to the extent of furnishing the lighting units without charge in view of the increased business which they would obtain later.

The locations for these demonstrations should be selected so that most effective results may be obtained. They should be on highways carrying heavy night traffic, and preferably where statistics are available covering the frequency and severity of accidents. If such statistics are not available, they should be obtained for a period of time before the installations are made, and of course, should be kept afterward, and the comparisons should be given due publicity. Coordinated advertising in automobile association publications and newspapers is also important. Appropriate lighted signs at the locations should call the attention of motorists to the purposes and conditions of the demonstrations, and to the contrast between the lighted and unlighted sections of the highway. This contrast could be intensified by operation of the lights only on alternate nights or weeks.

When public demand for highway lighting is thus created, these installations would become part of the larger installations, and the only expense to the utilities would be for the operation during the demonstration period. This should be a small price to pay for the load developed.—Wm. T. Hannum.

•

Rules and Regulations Wreck Many Sales

14 Farmer Brown calls on the power company. "Goin' to raise a few chicks," he explains and wants particulars regarding hooking up a 500-watt brooder. His conversation indicates that he is familiar with the company's efforts in connection with the disposal of a much talked of "power surplus". "Got any special rates for brooders?" he enquires.

A clerk consults a small book. "Yes, there are several rates. But why not hook it on the pumping plant meter?" The plant at this time of year is operating (when it runs, which is very seldom) in a seven-mill block of power. "For once in my life," muses Farmer Brown, "it looks like I'm going to get a break."

The clerk estimates that the brooder will consume 300 Kw.-hr. for the expected period of operation. "How much will it cost?"

"Let's see, just one minute please," and the clerk does some rapid calculating which shows something like the following information:

		Cost per Year
Increase in demand charge due to 500 watts added		$2.50
Cost for 15,000 Kw.-hr. 10-h.p. basis	$165.00	
Cost for 15,300 Kw.-hr. 10.5-h.p. basis	$170.10	
Cost for 300 Kw.-hr. additional	$5.10	$5.10
Net cost for brooder		$7.60

The clerk hands the slip of paper to Farmer Brown, who blinks at it. "Say," he says, "I thought you said seven mills, this figures out better than two and a half cents. What's the idea?"

"Of course," explains the clerk, "we are required to increase the plant rating when a load is increased in this manner, otherwise a separate meter would be required"—But Farmer Brown will let him explain no further.

"I thought you people had a surplus of power," he storms at the clerk, "why I can operate that brooder with oil for a couple of dollars and if that's the best I can get you'll have to keep your surplus power." With that closing remark he departs and heads for the nearest service station, buys ten gallons of coal oil and heads for home.

"Never seen sech fellows," he tells his neighbor over the cowyard fence, "got a surplus of power which is goin' to waste and if you want to use it up with anything except the pump, which ain't no need of runnin' in this rainy weather, they goes and jumps the price way up where a feller can't afford to use it."

And "ain't it the truth"? Our rates, rules and regulations oftentimes provide some almost impassable barriers to the procurement of desirable "off peak" load, and that coveted reward, "increased use, increased revenue and better customer relations," escapes behind that barrier regardless of a well planned and expensive advertising and sales campaign.—Jay Bee.

•

"Plug In" on the Consumer's Ideas

15 Why not let the user suggest plans for increasing the use of our surplus power. This plan has already been tried to some extent by different utilities but not, I believe, in the manner herein suggested.

Initiate a "system" wide suggestion collection. With each domestic consumer's bill, throughout the life of the plan, announce that the company will pay for every bona fide idea by which the electric service may be made more useful or desirable to the consumer, or some novel use to which he (the consumer) has already put his electric service, or a use he would like to make of the service if suitable means were provided.

The form of payment could be a 50 per cent reduction in that consumers domestic bill for any increase of consumption over previous three-months period (average), the reduction to last for three months as a reward for each new bona fide suggestion offered.

The advantages of such a plan would be fivefold:

1.—Consumer interest in electric service would be stimulated.

2.—Of the many suggestions received, certainly many would be of great practical importance.

3.—"Payment" would represent no cash outlay but an actual increased revenue, as the excess kw.-hr. would be almost "pure velvet". The power and facilities already exist.

4.—In the majority of cases the recipient would become used to the added use of electricity and will continue such use after his three months reward period.

5.—Subsequent suggestions by the same consumer would necessarily involve a further increase in his own consumption in order to "receive his reward."—F. V. GILLUM.

•

To Help the Farmer Get Electric Service

16 Individual consumers of electric power in some rural and outlying districts can only be given service under contracts calling for an annual minimum payment guaranteed over a period of years, otherwise the cost of giving such service would not be economically possible.

These contracts run anywhere from 50 to several hundred dollars a year. The actual amount of current used by such customers is measured by meter in the ordinary way and monthly bills rendered accordingly. Very often these monthly bills in the course of a year do not total the amount of the annual minimum guarantee. The customer is then obliged to pay the difference between his actual consumption and the amount guaranteed under the terms of his contract and it is then he may feel he is being asked to pay for something he never had. Showing such a disgruntled customer his signature on the contract often only serves to convince him more firmly that someone put a fast one over on him.

The root of the trouble, more often than not, lies with the power companies themselves. They get the customer's signature, hook up his house to the power mains, put in a meter and let him hop to it with never a word of advice or explanation. Why couldn't they say something like this: "Now, Mr. Jones, you have just signed a contract guaranteeing to pay us $100 a year for five years, in return for which we will build an extension with the necessary equipment that will bring electric service to your home. We don't think you will be able to use $100 worth of electricity for lighting in the course of a year and we are most anxious that you should get full value for the money you pay us under the terms of this contract. So we suggest that you consider installing (then would follow a brief talk on what modern electrical labor-saving appliances are available and which would be useful in this instance). The use of one or more of these appliances will increase your use of electricity during the course of the year to a point approximating the amount you have guaranteed to pay us annually. In this way you will be getting full value in service, comfort and convenience for every cent you pay us. You will not be faced with having to make an adjustment at the end of the year because your actual use of electricity did not come up to the value in money you have contracted to pay us, etc., etc."

Mr. Jones now has something to think about. He feels that the power company is out to help him rather than get all it can out of him. The power company should follow up (meter readers could be used*) the idea thus implanted in Mr. Jones' mind. They can form valuable and *mutually* helpful contacts between the consumer and the power company. They can act as salesmen to such customers off the beaten path, advising them and helping them to get the fullest benefit under their contracts. In this way the power company undoubtedly would sell some surplus power, additional appliances and do some good work from a public relations and future load building point of view.—Q.E.D.

•

Plan For Financing Highway Lighting

17 Our old friend, highway lighting, offers possibilities for a few business-building brainstorms. The brainstorm is not pointedly directed at this respectable member of our load-building group, but rather at suggestions for raising the money as painlessly as possible to pay for this much needed public protection. Here are two methods for accomplishing this objective:

1. Increase the state automobile license fee by $1 per year, this money to be applied to lighting the major state highways. This additional dollar should be set aside by law exclusively for such lighting. This would enable the state to provide hundreds of miles of highway lighting where it is urgently needed, without interfering with the present highway funds.

2. Set aside by state enactment a certain percentage of the taxes now collected from the electrical utilities, these funds to be used for highway lighting purposes. Since these taxes are paid by consumers of electricity, which takes in practically everyone who would be benefitted by highway lighting, it might be considered as a means of charging the public for extra energy and service which is turned over to the state to be used to light highways.

Approximately $3,000,000 per year would pay the total cost of lighting approximately 3,000 miles of highway and would probably take care of all of the state highway where night accidents are a problem. This $3,000,000 may seem like a lot of money but it is actually less than 5 cents per capita per month, based on the present population of California. In addition, the reduction of night accidents would save the public several times the cost of the lighting,

•

Use the Weather To Sell Electric Service

18 There are several ways to impress the electrical customer with the advantages of using electricity for comfort against heat and cold. In regard to cold the customer is too thoroughly impressed with the expense of using electric heat. This may be overcome to some extent by pointing out the cheap rates that are in force for this service and if they are not in vogue they should be. This should appeal especially to people who live where gas is not available. The main argument should be the cleanliness and handiness of electric heat.

The next step is to get in more electric ranges. There are two things here to consider. First, tell the customer about the rates for ranges. I know of a man who took out his range because he had been paying lighting rates for this for several years and did not know he was entitled to range rates. The next step for both range and electric refrigerators is to appeal to the freedom from heat in the summer. The last and most important is to keep everyone informed about the number of ranges and refrigerators that are installed. Everybody likes to be "in the swim" and nothing appeals to a person as well as to know that their neighbor has one and is pleased with it.

The next important item to sell is air cooling. The ordinary air cooling system is out of the pocketbook range of the majority of people. However, a home-made cooler may be made and installed in a home at very reasonable cost and these use more current than the fancy ones. Anyone who lives in the "big" valley or in the Antelope or Imperial Valley would never worry about a little added to the electric bill if they could keep cool in summer and all they need is someone to show them how to do it with a few dollars outlay.

A quarter horsepower motor at each house in the valley would use up a lot of kilowatt-hours—DANIEL MCFARLAND.

* The meter readers selected for this should know what they are talking about and care should be taken that the customer is not "high pressured" into buying an appliance he does not really need or that is unsuitable to his particular requirements. It can be done.

Cooperation on Parade + + +

[*Forecast of forthcoming cooperative merchandising activities, and review of activities in progress or completed, a summary of cooperation at work throughout the West*]

Launch Sales Drive That Outclasses T.V.A.

DETERMINATION that no national governmental challenge will find it wanting in the qualities of initiative and aggressiveness which have been responsible for its pioneering efforts, the Puget Sound Power & Light Co., led by its fighting president, Frank McLaughlin, opened the 1935 season with the most sensational sales program in the nation, even including the much publicized TVA.

Electrical dealers and plumbers throughout the territory of the company are enlisted in the program, together with every employee in the company. The program is directed along two major fronts, namely, the electric range and the automatic water heater. Consumers are offered terms as low as $1.95 down and per month for an electric range if the home is already wired, or $2.25 down and per month where the wiring is to be installed for ranges, and $2.35 down and same amount per month for automatic water heating, with a monel metal 20-year guarantee tank. Water heating is further stimulated by the offering of a special low rate of ¾ cents per kilowatt-hour.

For this sale a Hotpoint range has been featured. It is equipped with automatic oven control, 16-in. oven, porcelain enamel and chrome plate finish with three Calrod units. Automatic oven timer and clock can be had at small additional cost per month. The water heater is a Hotpoint automatic with a monel metal tank and has been specially designed to meet the company's specific requirements.

Dealers Get Bonus

Dealer, contractor and plumber participation takes place in the form of substantial bonuses for any sales placed by such dealers. A bonus of $15 for the water heater and $10 for the electric range is provided the dealer who meets a set of simple requirements. These include establishing the customer's credit with the company. The bonuses are to be paid in ten monthly installments. Where a dealer does wiring he will get the wiring provided his prices and materials meet company specifications. Servicing for the range and water heater are provided by the company. The term sale runs for a maximum period of 72 months where wiring is included and without wiring 60 months. Cash sales made by the dealers will bring the same bonus.

To enlist every employee of the company in this sensational campaign, a liberal bonus plan has been worked out

Still blazing NEW TRAILS!

—toward the MORE ABUNDANT *Life that comes with the* FULLY ELECTRIFIED *Home*

PUGET SOUND POWER & LIGHT COMPANY

Better Electric Service

Facsimile of the "opening gun" ad of the campaign

for employees who turn in prospects that are sold either by the company or by dealers during the first two-month period. On sales of new equipment $5 is offered for a water heater if it stays in service 6 months, $2.50 per range if it stays in service 6 months and for replacement sales $2.50 per water heater and $1.50 per range if either remain in service 6 months or more. Attractive booklets giving these details as well as the rules and definitions for the campaign have been prepared and are available from the power company.

Although the plan itself and the terms offered were sensational in themselves no less sensational were the methods of advertising and promotion used to awaken the public to the offer and to stimulate both employees and the trade generally to take full advantage of it. Banners and pennants of the sensational sale type, frequently used by bargain department stores, were used to decorate all of the district offices and made available to dealers to use in their stores as well.

A series of large newspaper advertisements broke in the press simultaneously. These began with a strong editorial type of advertisement signed by Mr. McLaughlin entitled "Still Blazing New Trails." In this it was pointed out that the company which had pioneered electrical development in the Northwest was still ready to pioneer the "more abundant life" with low cost electricity and low cost appliances.

Following this opening broadside were run straight merchandising advertisements featuring the terms and the appliances offered. In the rural papers of weekly circulation a full page, together with publicity articles and tie-in advertising, was used to get universal attention to the offer.

Employees were bombarded with sales bulletins, a sales newspaper and booklets telling them how to approach prospects and actually to make sales. Lighted billboards first, with teaser copy and later with details of the offer to the public; radio announcements on special programs from five stations in the company's territory in western and central Washington; attractive folders and direct mail literature for company dealers and employees to use; display posters and window streamers all were marshalled to forward the big sales program.

The campaign started Jan. 21 after a preliminary clearance sale of old stock and was to run until March 2 with company quotas of 600 ranges and 600 water heaters and the expectation that dealers would sell many times that amount. Seventy new salesmen were added to the company's staff in support of this activity. The program was launched by a large and enthusiastic meeting of all employees at which Mr. McLaughlin addressed the group and

One of the many illuminated billboards used

set forth the objectives of the company and which inspired the entire group with the tradition of "Blazing New Trails."

Beginning March 11 and running sixteen weeks to June 29, the campaign will swing into its second phase, known as the spring campaign. It will have a new quota of 2,800 water heaters and 3,000 ranges, to which are added 500 refrigerators. By this time 100 trained salesmen will have been given experience and preparation for the conduct of the drive throughout the spring months. At the end of June at least 66 per cent of the yearly quota on ranges, water heaters and refrigerators is demanded of the sales force.

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Club Committee Works for Street Lighting Project

A committee from the Electric Club of Washington, appointed by President Walter D. McDonald, to cooperate in the design and installation of a lighting system on Railroad avenue (extending along a large portion of Seattle's waterfront) will meet shortly with the city council, city engineering department and interested property owners to discuss the projected improvement.

The Club's lighting committee includes Herb Boring, General Electric Co., chairman; Tom Widrig, Trumbull Electric Mfg. Co.; Wm. S. Gaunt, Seattle Labor Temple; Norman L. Bost, National Electric Products Corp.; E. G. S. Pryor, Washington Surveying & Rating Bureau; Fred W. Carlson, manufacturer's agent; W. M. Meacham, Meacham Electrical Contracting Co., and Harry Martin, City Light Dept.

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• A SERIES OF BROADCASTS over radio station KOMO, Seattle, sponsored by the Home Service Bureau of the Puget Sound Power & Light Co., are being given by Mrs. Edith Rauch, home economist, specializing in modern electric cooking. Mrs. Rauch is supervising the extension over the radio of the bureau's services to women interested in better management of electrically-equipped kitchens, with menus for various occasions, recipes of all kinds, helpful advice about cooking and serving and with interviews.

Home Pump Campaign Sales Points Told

RUNNING water, by means of a pressure pump system, is being campaigned by dealers and the Utah Power & Light Co. throughout its territory in a campaign which began Feb. 1 and runs to April 1 and which again will be resumed from Aug. 1 to Oct. 1 of this year. The goal is 1,000 domestic electric water pumps.

In pointing out how dealers can cash in on the advertising that is being done and the direct mail material being sent to thousands of prospects, the dealer coordination department of the Utah Power & Light Co. makes the following suggestions as to sales points which will be effective in closing business.

"Independence on the farm really begins with the surrender of the old hand pump and the installation in its place of electrically operated pumping system.

"Running water means health protection, convenience, a safeguard against fire, cleanliness and greater profit in milk and livestock production and bigger and better garden crops.

"Running water on the farm need no longer be considered a luxury. A good electric water system is readily within the reach of your average rural home owner.

"No more helpful friend can be found on the farm than running water, piped into the house and other buildings, serving unfailingly, day after day, in all kinds of weather, and under all sorts of conditions."

Not only will such selling arguments produce results but the company further offers to display pumping equipment carried by dealers in its various local offices throughout the territory and to present these same arguments to prospects when they come to these local offices.

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Minimum Customers Are Object of Activities

STIMULATION of the so-called minimum bill consumer, to bring that consumer into the habit of using a little more electricity, enough to cover the cost of serving him at least, has more to it than just benefits to the power company, it was pointed out by Guy E. Davis, merchandise sales manager, Pacific Power & Light Co. It will stimulate that customer to buy electrical appliances from dealers and to have wiring installed by contractors. Hence the program of the company is concentrating on both of these aspects.

The program contemplates that all salesmen of the company make a certain number of house-to-house calls each week to talk over the advantages of additional convenience outlets and the usefulness of small appliances. Such minimum bill customers are divided into two general groups, he pointed out. First, those who have such small incomes that they economize by keeping their bills low and, second, those who can afford more use of electricity but because of misconception or lack of knowledge do so.

"Our efforts in this 1935 drive will be aimed principally at the second group," said Mr. Davis. "They form a large potential market."

"Adding load to the minimum bill customer is more important than adding load to the customer already using large amounts—and it is an important phase of the general plan for spreading the idea of complete electrification in the home. After convenience outlets and small appliances will come larger appliances and the desire for still greater use of electricity. The ultimate objective will be the largest possible number of customers using electric service to the limit of practicability. Experience shows generally that the satisfied customers are those who make full use of electricity in their homes."

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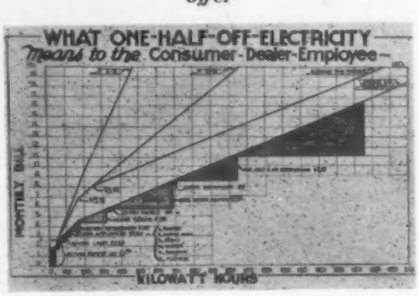
Shows How Discount Can Assist Sales

THE first cost of the appliance and the cost of operation have been two major objections which the customer has raised and which have definitely retarded the sale of electrical equipment in the past, according to H. H. "Kelly" Courtright, manager of Valley Electrical Supply Co. of Fresno, who further points out how the utility's special rate offers can be used to surmount this sales obstacle for a customer.

"With the 50% discount offer, however, we have an effective sales tool to offset these two primary objections," he says. "If the customer will purchase

Chart used by the San Joaquin company salesmen to show exactly the place on the rate block occupied by each appliance added to the domestic lines. This was used tellingly with consumers to show the actual advantages of using the company's "half-off" offer



an electrical appliance, a range, a water heater, a refrigerator or whatever it may be, and that appliance increases his consumption of electricity over 1934, then it is perfectly obvious from the terms of the 50% discount offer that the appliance can be operated for the year 1935 at one-half what it would normally cost. That overcomes the objection to the cost of operation.

"If the customer objects to the first cost of the appliance, then the saving effected during 1935 can be applied in terms of a discount on the purchase price of the appliance, and we have lessened the sales resistance built up due to the first cost objection. So we can use the 50% discount offer to tear down either the cost of operation or the first cost, whichever may be paramount in the customer's mind. Then too, we have the clinching argument that he must buy now if he is to reap the full saving offered. Each month that he lets slip by cuts into his saving and reduces the amount to be applied as a discount on the purchase price of the appliance.

"The load building activities of the power company for the first six months of 1935 will center around the '50% discount offer.' Contained in this offer are many advantages to the customer, the manufacturer and jobber, the dealer, the employee and the company.

"In it the customer will find a greater opportunity to enjoy the comfort and convenience of the increased use of electricity at a very nominal cost. He can use it to obtain a discount on the purchase price of electrical appliances if he buys now.

"In it the employee will find a greater opportunity to tie in with the load building program of the power company.

"And in it the power company hopes to stimulate the consumption of electricity to a point where a permanent rate reduction can be effected. Only through the increased use of electrical energy can a saving be passed on to the customer."

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Lighting Certified for Portland Stores

CERTIFIED lighting, with a genuine certificate presented to the store which has revamped its lighting in accordance with the best practices of illumination, is an idea that was developed by the Northwestern Electric Co., Portland, and is making considerable success throughout that company's territory.

When a customer has his lighting revamped a certificate is lettered with his name, framed and placed in a prominent place in the store or office. This attracts the interest of others and arouses not a little pride in the lighting installation in the minds of the owners and tenants of these commercial establishments. It is proving an effective tool with the commercial lighting salesmen. One of the attractive installations made recently is the Burnett Brothers' jewelry store, illustrated herewith.

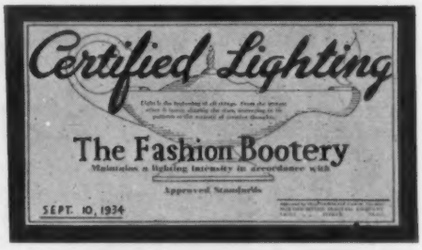
Originally the idea applied only to Northwestern Electric Co. customers but has now been broadened and in a a cooperative spirit includes Portland General Electric Co. customers as well. A committee of lighting specialists in town has been appointed to examine each prospective certified lighting installation. The committee is using the standards of the Illuminating Engineering Society and makes its report on a special form.

This chart form lists the load and lighting data previous to change and after the change. It notes wire sizes, type of fixtures, number of outlets, intensities and wattage for signs, exterior lighting, interior lighting, window lighting, showcase lighting and total load. Listed are the general lighting in watts per sq. ft. and bowl brilliancy before and after installation. Lamp and socket voltage are also noted.

Certificates were formerly signed by L. C. Merwin, vice-president and general manager of the Northwestern company, but under the new plan they are signed by this lighting committee.

The committee is composed of four lighting specialists, M. S. Glenn, of Northwestern company; T. W. Fitch, Portland General Electric Co.; Walter E. Potter, General Electric Incandescent Lamp Department and Curtis Curry, of Westinghouse Lamp Co.

Eight firms had been certified and nineteen more ready for certification in Portland early in December. Dealers in lighting equipment and contractors who do the wiring are finding this campaign a great stimulant to their business and a real cooperative help from the lamp companies and the utilities.



Certificate in which the name of the shop is hand lettered and the date inserted and which is framed and presented to a store which remodels its lighting according to approved standards

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• PHOENIX, ARIZ., had more than the usual attention devoted to electric appliances during a four-day Better Homes Show conducted in the Shrine Auditorium by Mrs. Florence Austin Chase under the sponsorship of the two newspapers, the Arizona Republic and the Phoenix Gazette. Record attendance was had on each day of the program. While the show stressed all features of better homemaking, electric appliances were prominent in the cooking demonstrations which were a feature of each day's program. Entertainment included operatic selections.

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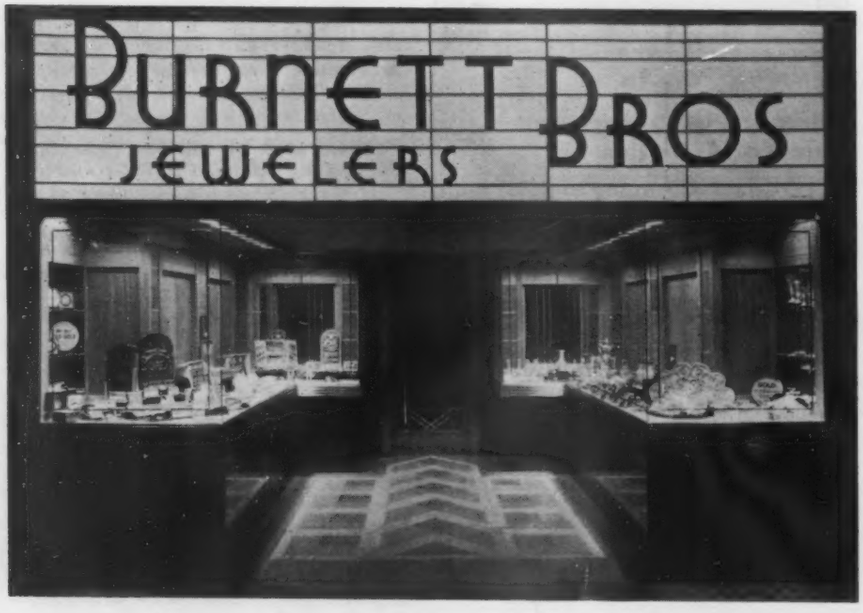

One of the "Certified" shops, with a modern and brightly lighted front. Behind the flashed opal glass of the name panel are 117 25-watt lamps on 9-in. centers. In the windows are 200-watt lamps on 12-in. centers, providing 500 ft. candles of intensity. The interior is lighted to a 24 ft. candle intensity throughout

Contrast between certified lighting and ordinary inadequate lighting is dramatically shown in this picture of Morrison St., Portland, where the certified installations at Burnett Bros. on one side of the street, and Fashion Bootery on the other, illustrate how a store by spectacular lighting can be made to stand out among its neighbors. Intensity in the Burnett Bros.' windows is 500 foot-candles; in the Fashion Bootery 300 foot-candles. Both utilize luminous lighting panels of flashed glass in addition to window reflectors

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Appliances Big Feature of Western Market Week

Unusual in the heavy attendance and interest in the displays of new merchandise was the Western Furniture Market held in San Francisco at the Western Furniture Exchange, Feb. 4-9. Particularly interesting to the electrical industry was its Western Radio and Appliance Show which has become an increasingly important factor in the Market Week.

Exhibited at the show were the electrical wares handled by Apex Rotarex Manufacturing Co.; H. R. Basford Co., Kelvinators, Prima washers and ironers; Bushnell Sales Co., Fada radios, Potter refrigerators and Radiobars; Chanslor & Lyon Stores, Inc., Crosley radios and refrigerators; Geo. H. Eberhard Co., Arvin heaters and radios, Grunow refrigerators and radios, Ironrite ironers, Standard electric ranges and Voss electric washers; Albert Groeschel, Bersted appliances, Miracle and Century appliances; Michael D. Henry, Barton washers, Belmont radios and other lines; Incandescent Supply Co., Lightolier floor and table lamps and lighting fixtures; Leo J. Meyberg Co., Inc., Norge refrigerators, ranges, air conditioners and washers, RCA Victor radios, RCA Radiotron, Samson and Westinghouse electric appliances; Thompson & Holmes, Ltd., ABC washers and ironers, Royal and Dormeyer mixers, L & H ranges, Royal vacuum cleaners, Ken-Rad tubes and Zenith radios; A. D. Wunder Co., Gaffers & Sattler electric refrigerators; besides a number of portable lamp makers.

Appliance Dinner

Wednesday evening was devoted to a trade dinner for the radio and appliance division, presided over by L. B. Quimby, of L. H. Breuner Co., Oakland, who is chairman of the Radio & Appliance Buyers Advisory Board of the Furniture Exchange. Members of the Norge show "The Freedom of the Shes" provided entertainment. Speakers were Harrison Holliway, manager, KRFC, San Francisco; Al C. Joy, manager, publicity and advertising department, P. G. and E., and George H. Eberhard, president, George H. Eberhard Co., San Francisco.

Mr. Holliway spoke of the great market in the replacement of obsoleted radio sets. Radio habits of the public have changed, his station has found, with the novelty of radio wearing off. High fidelity transmission, he said, should be matched by high fidelity reception in the new sets at home. He suggested some modification of the old home demonstration ideas be used to sell the public by actual demonstration in their homes the difference between the reception of old sets and of the new high fidelity receivers. "There is a swell show going on every day and night," he said in conclusion, "but most of the public is sitting in the upper rows of the balcony as far as their ability to enjoy it is concerned."

Al Joy stressed the value of the pride of ownershop appeal in electrical appliances. In following the theme of the entire meeting recited the '35 ways to increase sales. Among these he named such things as "tie in with cooperative advertising and promotional campaigns," "use trademarks," "make the most of brand names and their advertising," "have enthusiasm in your work as you have in sales meetings," and a number of other points.

George Eberhard, speaking on "prosperity through the kitchen," dwelt more upon the individual dealer's and salesman's job in the present situation. He pointed out that recovery is not dependent upon legislation, parties or reform, that there never has been a shortage of markets for products that the people want at the price that they can afford to pay and that people are still interested in things they want and need. Dealers, therefore, who have the courage—which he defined as nothing more nor less than a willingness to serve—always have an opportunity, depression or no depression.

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Dealer Contests in 1935 Announced by Institute

PRIZES totaling $2,400 will be offered to dealers of the nation in a contest sponsored by the electrical housewares committee of Edison Electric Institute in conjunction with the appliance manufacturers.

The basis of the awards for January, February and March will be "the best plan for sales training of retail clerks in selling electrical housewares and how the plan was applied." A second contest for April, May and June will give prizes for the best window display. Another for July, August and September will give prizes for the best store display. For the last quarter, October, November and December, the best sales and promotional plans will be given the prize.

A first prize of $100, second prize $50, is offered to winners in each of three classes, (1) departmentalized stores (2) other retail outlets and (3) utilities. There will also be five honorable mention prizes of $10 to be offered in each class.

Contributing manufacturers are General Electric Co., Hamilton-Beach Manufacturing Co., Knapp-Monarch Co., Landers, Frary & Clark, Manning-Bowman Co., Proctor & Schwartz Electric Co., Robeson Rochester Corp., The Silex Co., Waters-Genter Co., Westinghouse Electric & Manufacturing Co., Swartzbaugh Manufacturing Co. and American Electrical Heater Co.

The monthly news sheet "Electrical Housewares" will be distributed among manufacturers, wholesalers, dealers and all classes of utilities and will expand upon last year's topic "Table Cookery" and include all items such as irons, clocks and the like in the promotional program of national dimensions.

The national attention which will be given to electrical housewares of all kinds should result in an expanded market for these wares for all dealers.

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• AMONG THE FIRST four winners of the Westinghouse national window display contest for washing machines and appliances was T. A. Edmiston, Southern Colorado Power Co., Pueblo, who won second award.

Summarizing the Refrigeration Sales Presentations

REVIEWING the shows presented by the various manufacturers of electric refrigerators and home appliances, shows staged either for their dealers, their sales organizations and the utilities —or for the public, as in the case of the Norge show—leaves a reviewer with certain coincident impressions. Each refrigerator is the very best that has ever been made, can be made, or will be made. Each manufacturer is pluperfect in finance, factory facilities, stock on hand for anticipated demand, advertising dominance and sales aids. Each box has gadgets galore and yet each will stress basic refrigeration above all things.

When these similarities of superiority are conceded to every make, and, in a sense they check each other out, there remain many unique and interesting features in each presentation which give distinction to an otherwise standardized list of sales talk. In one other sense are they all similar this year too, and that is in starting their marketing early. The shows this year were a month earlier than last year, and that to western desert regions is the answer to a long felt want. The season starts early in the West.

• KELVINATOR led the cavalcade this year with its show in early January. It will also lead with the total number of models available to the trade for exploitation. Nineteen models were displayed at the show and two have since been announced, making a total of 21 standard domestic models ranging from the Kelvin Chest, a small 3-ft apartment house job to the Super De Luxe four-in-one of 23 cu. ft. capacity. All are powered with the same condensing unit. Kelvinator's four lines include the K or competitive line with lacquer exterior and porcelain inside finish; the P or porcelain line with more features; the De Luxe line with still more features and "food file" and the Super De Luxe with its four refrigerators in one. The latter is equipped with a special brine tank to provide the intermediate steps of cold. The four different stages run from the frost chest, which is a cold storage compartment to a super-fast freezing compartment, then a standard freezing compartment and, fourth, the food compartment itself. The food file is an arrangement of compartments for storage of foodstuffs in their proper location relative to the freezing unit. Kelvinator's program included sound film presentation. Also introduced was a line of air conditioners and an expanded line of commercial refrigeration equipment.

• WESTINGHOUSE struck a "streamline" theme in its presentation, which was built upon and around its House of To-

Striking the keynote that "Frigidaire is Ready" was done by that company in a sound picture of a sound picture being prepared—from which this is one scene. H. W. Newell, sales vice-president, was "shot" instructing the four leaders of the company's convention crews prior to their tour of the country

morrow. Its new models feature additional gadgets, including an all-metal tray that ejects ice cubs without the necessity for placing the trays under warm water. This is explained to give additional cooling capacity to the ice in that it leaves the tray at 4 deg. above zero. Another feature is a revolving shelf.

Support will be given the line by a national advertising campaign in household magazines in full color photographs, which will be supplemented by short technicolor trailers in moving picture theatres illustrating the main feature of the current ad. A line of commercial refrigeration has also been added. A second, or competitive line of refrigerators, which are said to be nothing other than last year's models for which the dies and equipment already has been set up, has been added to supplement the feature line.

Other presentations were better staged as to theatrical effect but no one of all the sales shows presented so effective a sales message as did V. E. Vining, of the Mansfield works. Mr. Vining's unusual ability to visualize for the salesmen just how each feature and basic principle of his refrigerator should be interpreted and translated into the language of customer's convenience and necessity, equipped his listeners with a better sales technique than did the presentations of almost all of the other shows.

• FRIGIDAIRE, as usual, put on the most showmanlike presentation in its all-day program. It, too, is bringing out additional numbers to increase its line and strangely enough is retreating from the gadget appeal, in which it has always previously been several jumps ahead of competitors. This year it will lay extra stress on basic refrigeration. To do that effectively it will display refrigerators stripped of all gadgets and even shelving so as to concentrate the prospect's first attention upon the basic refrigeration and the so-called "superpower freezing unit."

Exceedingly clever was its opening in which it brought the 3,000,000th Frigidaire to the convention by means of a talking movie, which terminated dramatically in the actual presentation of that model upon the stage of the meeting. It was predicted that double its last year's volume of air conditioning will be done this year in that line of products. This, as well as the commercial end of the business will be stressed in extra heavy fashion.

Spectacular will be its advertising, with large color spreads in the national magazines, featuring the beginning of the fourth million refrigerators by the company this year. Interesting, too, will be that the company is definitely determined to identify the name "Frigidaire" with itself exclusively, since it has become universally used as the name for all electric refrigerators rather than the name for the General Motors product alone. A company radio program began in February, featuring Jack Pearl, who introduced a new character, "Peter Pfeiffer." The Western tour of the show headed by L. H. Clark, manager of the Sales Planning Division, and included in its cast that sterling actor, Al Harrison, of the Frigidaire organization in Los Angeles.

• NORGE'S presentation this year took a unique form indeed. It was a show for the public; more particularly the prospects of Norge dealers, who were given free admission tickets by such dealers and who packed the houses in 57 cities throughout the nation to see the show, "Freedom of the Shes." Written by the sales manager of the company, the show took the form of a five-act comedy, in which a family is sold first a refrigerator, then the other Norge appliances by good salesmanship and good dealer displays. Intermissions were devoted to vaudeville skits and "black outs," again featuring Norge products. This year these include a gas and an electric range, in addition to the refrigerator, oil burner, air conditioner, and washer line already made by the manufacturer. Heavy stress was laid upon the low cost of operation of the

rollator mechanism. The theme of the play was built around the long life of the mechanism, one of which has been running, on a factory test, the equivalent of 33 years of normal operation. The last scene of the play depicted the family 33 years hence, after women had taken over the government as well as all business affairs, and men are to be found in the sheltered position of the home makers. This brought out many amusing sidelights.

Norge has made few changes in its refrigerator; none at all in its mechanism. The cabinet remains simple and comparatively gadgetless, relying on sheer performance and ample dealer's discounts to repeat its sales records of the past.

• GRUNOW refrigerators were presented at an evening meeting of dealers and salesmen in a number of western cities. Stronger than ever this year will be advertising and sales appeal made over its exclusive safe refrigerant "Carrene." Display of the endorsement of this refrigerant which has come from the American Medical Assn. and publications of the medical profession will be particularly predominant.

Mr. Grunow, himself, spoke to the convention, in each case, by long distance telephone, his voice being amplified for the benefit of the audience. As assurance of financial stability the company's financial arrangement with C.I.T. was discussed. Strong emphasis was also placed on the liberal discount to dealers, offering greater profit margin in the sale of this refrigerator.

Carl Boyd, district manager for the Southwestern region, and Bill Darden, for the Northwestern region, laid stress upon the colorful career of Mr. Grunow in the pioneering of refrigerators and radios. A factory engineer, James Veilter, gave a description of the new lower priced line which is being introduced this year, employing a slightly smaller unit but with the same refrigeration principle. The Carrene demonstration is going to be a very dramatic feature in the selling of this organization this year.

Advertising backing will be given by a radio program featuring the Minneapolis Symphony Orchestra added to advertising in national magazines, all of which will feature the safety of Carrene. A label certifying its safety and approval of the medical association will be prominently displayed in each refrigerator. The company also offers the same five-year service plan for $5 which has been featured by other manufacturers.

• GENERAL ELECTRIC compressed into a single afternoon a show which encompassed the selling plans for not only refrigerators but their kitchen companions, the range and refrigerator, and for good measure included the home workshop and washers, vacuum cleaners and ironers. Likewise it introduced its now famous "talking kitchen" to the westerners who had not seen it at the Century of Progress at Chicago. Much improved in showmanship since its first road show several years ago the presentation this year carried as a main theme what will continue to be that company's program for the year. This theme is "sales training."

Besides its familiar monitor top, now neatly skirted with a single band of metal, the flat top line will be added to this year, and as a competitive new line a simplified "ball top" with a new principle of oil cooling for condensation is utilized for the first time.

Using as its central characters Father time—shaved and quite modern—Dr. Decision, an expert on health matters, and a lazy salesman who finally realizes that he can make no headway without training, and then becomes a very successful salesman, the various selling points were demonstrated. On refrigerators the strong selling emphasis will be placed on the time-tested qualities of the mechanism and upon health protection.

F. N. Ashford, salesman for North Coast Electric Co., Portland, sorting some of the thousands of prospect cards which were obtained as a result of the Norge show, "Freedom of the Shes." Each dealer receives his own prospect cards and then goes to work by 'phone and personal call

What will probably prove most effective is a progressive system of selling from one appliance to the next, with an extended contract and no down payment once a customer establishes good credit and paying habits. After six months payments have been made promptly a range may be added at a small increased payment. Then next comes the dishwasher.

Electric range selling will place major emphasis upon superior healthfulness of electric cookery, with actual tests showing greater loss in mineral salts and vitamins when cooked by old methods. This is a sales appeal that Orr Crites of Portland developed and has used so successfully. Another very effective sales point was developed for electric cooking. It was shown that the most penetrating heat is derived from the red and infra-red end of the spectrum, the band in which electric heat is concentrated, whereas other types of fuel give off heat in the higher spectra and while it is higher heat, it is of a less penetrating type. Thus electric heat is claimed to be superior for waterless cooking because of this penetrability.

Dishwashers were moved from the class of a luxury appliance into one of definite economy by analyzing and listing crockery breakage, savings in incidentals to dishwashing, savings in doctor bills because of more completely sterilized dishes at temperatures which the hands cannot stand, and the housewife's time saved, for which an estimate of at least 30 cents an hour was ascribed.

The home workshop, not only for boys, but to bring manual relaxation to office men who need a home hobby that will save them from breakdown in later life, was a newcomer to appliance sales but one which should prove profitable. In presenting the other home appliances —washer, cleaner, sun lamps, and ironer—an excellent point was made that these should be used by dealer or salesman to round out his selling, to serve customers who need these before getting other major appliances, to add to salesmen's earnings during the off months when refrigerators do not move so fast.

• OH YES, there was one other thing upon which all manufacturers agreed this year. That is that 1935 promises to be the biggest in the history of the industry.

•

Details of Burbank Rental Plan Told

INQUIRY as to the details of the electric range trial plan as operated in the city of Burbank has brought the following summary of the plan as it is being handled, from Robert Mead, public service department of the city of Burbank.

The rental fee is $1.50 per month with 25 cents additional for an electric timer and 25 cents additional for a thrift cooker. The maximum rental period is twelve months; the minimum six months, unless the customer decides before that time to buy an electric range. At any time during the trial period either the trial range or a higher priced range may be purchased on contracts ranging from 6 to 36 months. If and when a customer decided to purchase a range all the trial fees paid up

to that date are credited to his account on the purchase of the range.

A trade-in allowance of $10 is possible on old cooking equipment. If the old range is turned in at the time the trial range is installed, $4.50 of the $10 allowance is applied as a part payment of the trial fees. The owner, therefore, pays nothing for the use of the range for 2½ months. A renter must pay six months' trial fees in advance, the old stove constituting $4.50 of this.

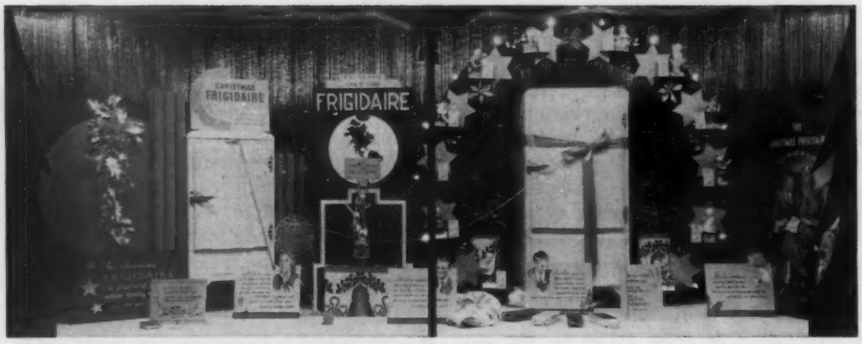
When a range is purchased, either by a renter or an owner, the additional $5.50 to make up the $10 total is applied for the benefit of the customer upon the purchase price of the range. All trial fees actually paid, plus $10, are deducted from the purchase price when the customer decides to buy.

A cooperative merchandising plan is in force providing for the sale of these ranges by dealers or by the department.

•

Northwestern Estimates Years Dealer Sales

WITH its full electric appliance sales quota budgeted, the Northwestern Electric Co. at Portland, which itself does not merchandise, announced that the dealers cooperating with it would sell an estimated total of $1,195,348 in appliances to its consumers during 1935, according to George H. Wisting, assistant general manager. The company feels that conditions justify a more extensive and intensive sales activity than in the past three years. It plans to support dealer sales with advertising and sales promotion, which is managed through its utilization bureau by James B. Buman.



Effective use of manufacturer's display material to create a convicing sales window won for the Kimball-Upson Co. of Sacramento the first prize in the Electric Appliance Society's contest for Sacramento, Stockton and San Jose stores

Almost half of that total, an estimated 2,680 units, is expected to be supplied by sales of electric refrigerators.

It is also estimated that 44,264 units of miscellaneous appliances, including heating pads, heaters, lamp bulbs, irons, ironers, sun lamps, vacuum cleaners, washers, clocks and fans, will account for $387,000 of that amount. Radios are ranked third with 2,778 units contemplated. December radio sales in Portland reached 3,616. Electric ranges are expected to add $73,300 to the total with 680 units.

With this index of expected sales dealers in the Portland territory can plan their own programs to better advantage and prepare to concentrate upon the appliances listed when the promotional effort directed at them is launched.

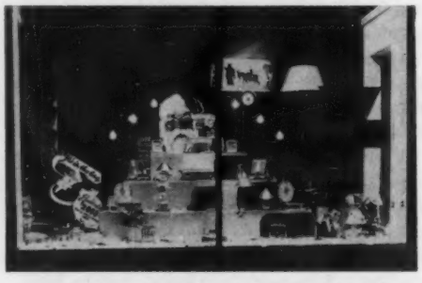
•

Ross Predicts Rate Reduction Soon

Probability that the progressive reduction on "City Light" residential rates, long planned by J. D. Ross, superintendent, will be started soon, possibly before summer, is announced by Superintendent Ross. He stated:

"I assured the administration sometime ago that as soon as there was an upturn in business there would be a reduction of one-half cent in the present charge of 5½ cents per kilowatt hour for the first 40-kilowatt hours of current for residence use. There is no announcement of a cut at this time, as we do not wish to decide the question until after the state Legislature adjourns. We do not know what legislation might be enacted that would effect the situation.

"We can say, however, that there is a definite, though small, upturn in business. It is apparently very steady so that a progressive reduction of rates will, we believe, be possible a little later.



With a double window and its entire front decorated, the North Bay Electric Works, San Rafael, won the first prize in the Electric Appliance Society's Christmas window display contest for all towns other than the metropolitan centers

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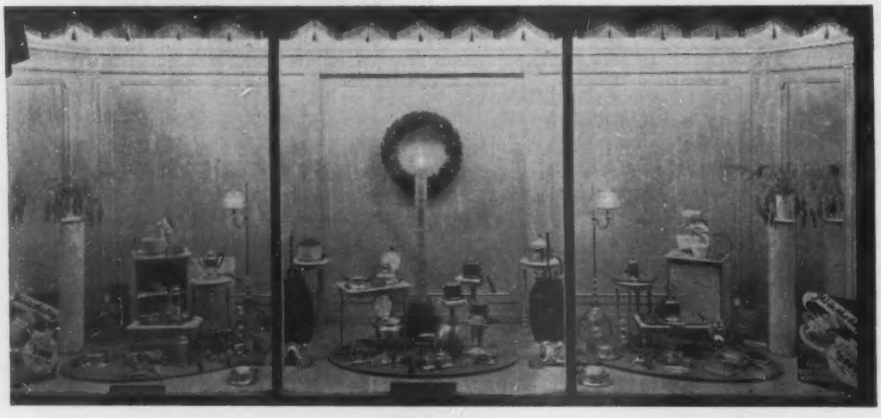
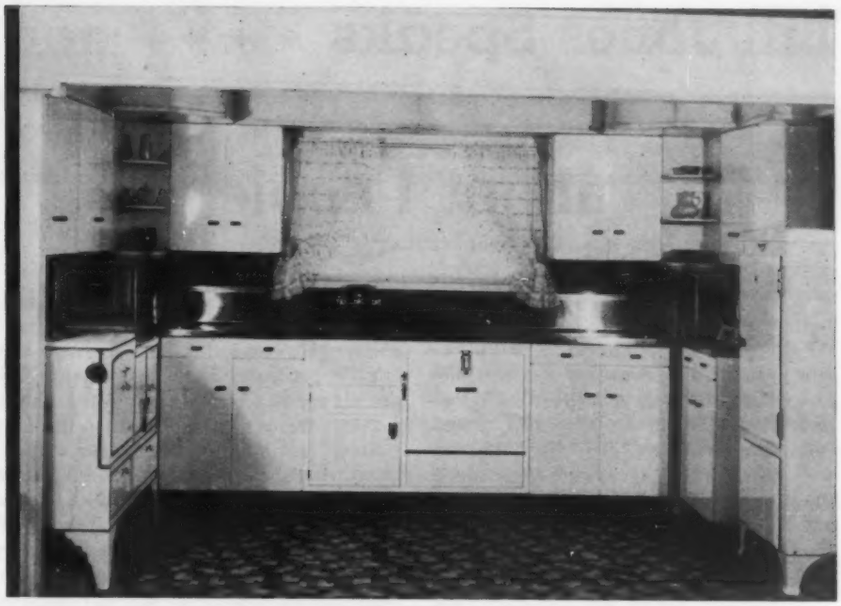


Perfect balance and excellent individual display of its many appliances won for Nathan-Dohrmann Co., San Francisco, the first prize for the best Christmas window display in the Electric Appliance Society's contest. This was adjudged the best window in San Francisco and Oakland districts

Bureau Makes the "Build a Home" Appeal

POWERFUL appeal to the "Build-a-Home" urge is being made by the Bureau of Power and Light, Los Angeles, in its spring advertising and promotional work. This in turn reflects itself in the electric home idea. To follow this advertising and make it effective for dealer sales the Los Angeles Electric Cookery Council has begun a sales school for dealers and their salesmen under the direction of Chet Dye and John Stigman.

The sales school began Feb. 19 with classes held at 120 East Fourth St., running from 2 p.m. to 8 each Tuesday,



A cooperative model kitchen installed in the display room of the Bureau of Power and Light, Los Angeles, under the direction of William P. Swartz, of Standard Electric Stove Co. Beside a Standard range is a Frigidaire and a Conover dish washer. Cabinets were by the Elgin Co. and the kitchen was constructed by Hollywood Metal Products Co. from a design by Louis Singleton, salesman for Standard ranges

Wednesday and Thursday. Lectures and demonstrations constitute a part of these activities and speakers will be called upon to address the classes from time to time.

The advertising in support of this sales effort is built around a very appealing statement, "If you pay as much as $32 rent—you could be buying an electric home of your own." Floor plan of a modest five-room bungalow which could be financed under the National Housing Act new building loan and made all-electric is depicted in the advertisement.

The Bureau has a special department set up to aid its customers in making applications. These customers are asked if they have any preference as to the dealer who should receive the order. When no definite preference is stated sales are impartially placed among the dealers.

At the appliance display rooms of the Bureau two new electric kitchens are being added to that already installed there by the General Electric Co. The first is independently sponsored by W. P. Swartz, of Standard Electric Range Co. The second will be installed by the Westinghouse Electric & Manufacturing Co.

DEALER SALES REPORTS — DECEMBER-1934, JANUARY-1935

A Summary of the Dealer Reports Compiled by Associations, Societies or Bureaus, or Dealer Contact Departments of Utilities

APPLIANCE	P. G. and E. Co.[1]	San Diego Cons. G.&E.Co.[2]		San Joaquin Lt. & P. Corp.[3]		So. Calif. Edison Co., Ltd.[4]		Utah Power & Lt. Co.[5]		Wash. Water Power Co.[6]
	Dec. 1934	Jan. 1935	Past 12 Mo.	Jan. 1935	June to Dec. 1934	Jan. 1935	Jan. 1934	Dec. 1934	Jan. 1935	Jan. 1935
Ranges	90	3	203	117	675	306	96	69	90	11
Water Heaters	22	2	28	48	376	192	15	8	.....	2
Air Heaters—aux.	976	194	554	.....	.....	232	126	258	57	71
Air Heaters, 220 volt	71	.....	.....	83	328	.....	.....	.....	.....	.....
Refrigerators	1,595	110	2,620	104	1,573	777	353	182	172	112
Dishwashers	4	.....	.....	.....	14	.....	.....	.....	1	.....
Washers	2,501	207	2,283	193	2,659	1,827	962	431	564	315
Ironers	887	48	353	47	367	265	113	44	21	46
Vac. Cleaners	2,096	107	850	53	696	590	318	713	462	270
Radios	8,271	810	7,690	441	4,050	4,115	1,553	1,668	1,165	755
Mixers	97	47	632	57	901	297	151	561	178	111
Cookers & Caseroles	.....	12	578	12	227	40	6	10	8	134
Irons	.....	168	1,885	223	3,024	1,064	479	1,335	716	353
Waffle Irons	.....	146	592	130	1,345	425	165	1,236	280	135
Toasters	.....	189	961	124	1,564	536	245	1,513	387	355
Table Stoves, Grills, etc.	.....	33	395	114	1,575	221	228	1,963	579	.....
Heating Pads	.....	89	304	.....	.....	312	152	573	202	95
Curling Irons	.....	.....	.....	.....	.....	61	65	387	161	.....
Percolators & Coffee Makers	.....	121	676	105	1,242	293	143	578	136	280
Sewing Machines	1,218	14	50	.....	.....	.....	.....	.....	.....	36
Clocks	.....	.....	.....	87	1,166	364	198	611	137	191
Fans	.....	.....	.....	.....	.....	15	4	19	7	8
Floor Polishers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sun Lamps	.....	.....	.....	6	40	30	14	28	8	4
Portable Lamps, Reflectors	.....	.....	.....	86	932	.....	.....	5,175	1,164	351
Misc. Lamps, Pin-up, etc.	.....	.....	.....	.....	.....	.....	.....		785	879
Yard Lights	.....	.....	.....	37	341	.....	.....	.....	.....	.....
Misc. Small Appl.	.....	215	1,486	154	1,587	311	198	196	.....	.....
Total Dealers	1,440	100	100	.....	150	577	701	.....	.....	.....
No. reporting	900	75	Ave. 75	83	Ave. 97	489	225	240	253	.....

[1] P. G. and E. reports obtained only on major appliances upon which accurate reports are available from dealers' accounts. Total dealers include gas as well as electric dealers. First report of year 1935 starts with Dec., 1934 and will be cumulative from that month.
[2] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Clocks, fans included under miscellaneous.
[3] Includes dealer reports from Midland Counties Public Service Corp. territory also. Compiled by Valley Electrical Supply Co.
[4] Includes reports from dealers on San Joaquin Valley system of the company as well as Southern California areas served. Comparative figures of same month last year indicates improvement.
[5] Includes Utah Power & Light Co. territory in Utah, Idaho and Wyoming. Also Western Colorado Power Co. territory.
[6] Dealer sales only for Spokane and company's territory. Company sales not included. Table stoves, grills included with cookers.

Bill Jones Speaks + + +

about People

"—— !***——, blankety-blank," ejaculated the Manager as he slammed the phone down, and then, aware of the entrance of a visitor, "I beg your pard—," stopping abruptly as he saw Bill Jones. "Oh, it's just you."

"You shouldn't accelerate your blood stream that way," said Bill as he absentmindedly took a cigar from the Manager's desk. "And you shouldn't cuss like that. Once upon a time when I was younger, all of my remarks were punctuated with blasphemy, but at least I do flatter myself that I used more originality than was shown in your pitiable exhibition. And then one day after I had my first automobile, I suddenly realized the futility of it all. I was making the trip on the desert out from Bakersfield, and in those days that was a venturesome journey. I was many, many miles from Mohave when a tire blew up. After an hour and the use of about all of the swear words I knew, I finally got it patched, pumped up and went on my way, only to have another blow-out five miles farther on. It took over two hours this time.

"Well, eventually I had a third tire failure, and I never suffered so in my whole life. This time there was no water in the canteen or in the radiator either, two burnt-out bearings on the engine, the tire pump leaked, and I had squandered and exhausted my entire repertoire of profanity the first and second instances so that now in the supreme emergency I didn't have a single unused word left in my working vocabulary. And there I was. You see, if you use up all of your best words on trifles, you have no adequate reserve for really important disasters."

"Very interesting—maybe," grouched the utility head, "but a lot of people give me a pain in the neck. A mass meeting was held last week in Plainsville and townspeople passed a resolution demanding an impossible reduction of rates, or, as an alternative, calling upon the government for assistance in putting in their own plant. The whole thing was agitated by a shyster who wants to be District Attorney. Just before you came in, I was talking to Councilman Crookes of the Seventh Ward, and in his oily, sleek way he informed me that he has learned that the poor people of his ward feel that in these hard times they shouldn't have to pay more than half their present bills. He says he has learned that twelve petitions have been typed and are all ready to be placed in circulation for signatures demanding that the City Council call a bond election for a municipal plant. He, of course, doesn't know who has the petitions. Well, I know. He himself is the nigger in the woodpile. In addition to being a 'crook by name and by nature', he has been in communication with an internal combustion engine manufacturing concern and a shady firm of engineers who make a business of finding the right sort of a man in each town to stir up a muss and who will accept a nice fat bribe if it goes over."

"Stop!" shouted Bill. "You are going to get me weeping, and I don't know just how to extend consolation to aggrieved and desolated utility managers."

"I don't want any of your sympathy —either real or hypocritical."

"Well, you aren't getting it; either way," mused Bill. "With the past ten years of your existence plentifully sprinkled and punctuated with countless signs so easily read that you should have been able to take warning from them, I gather that you still think that public resentment against your company is because the public believes—or has been led to believe by designing and crooked politicians—that you have been robbing its purse by excessive charges for your services."

"Well," snapped the Manager, "isn't that just what it is? From San Diego to Halifax, from Vancouver to Key West, isn't every cheap little politician, and some mammoth ones, egging them on to demand just that, regardless of the reasonableness or unreasonableness of our rates. It is the almost universal cry."

"No, you are wrong, and have been wrong for all of these years as to what is really the prime mover behind public distrust of your companies. No, it isn't your rates, even if that is the word most used by their mouthers and in their newspapers; and the activities of the politicians are merely contributing. not basic. Actually rates don't have any appreciable bearing on the thing at all. The people don't care a lot whether they pay $3.00 a month for electric service to you or if they pay $2.80 to a city plant.

"If the people aren't demanding rate reductions, then why are they going through such destructive gyrations to get them? And they are getting them, too."

"Well," said Bill with a great show of patience, "it is too bad that you power company people have so far removed yourselves from the people that you don't even begin to understand them. A little garden variety of elemental psychology or knowledge of human nature would be a good thing for all of you. For many years you have had more than ample opportunity to prepare for the deluge. At least two years ago the Master Politician of them all told you that things were going to change—that things were going to happen to you; and yet with that knowledge broadcast from the mountain tops and emblazoned across the skies, you can't name a single thing you have done to meet or avert the cataclysm. You have sat and let it come. Well, it is here; and now you don't like it. The people aren't especially fussed up over your rates. They wouldn't like you any better at 4 cents a kilowatt-hour than they do at 6½ cents. They don't like you at any price. They don't say it in these terms, for the distrust is inherent and somewhat subconscious in their inner beings. It is sort of nebulous in form, but very real nevertheless; and they are merely expressing themselves and their disapproval in the most convenient and soul-satisfying way available to them—to injure you where it hurts: in the pocket book through rate reductions. As long as you continue to talk to them and as long as you think about rates, you are merely trying to treat a symptom instead of the disease itself."

"Oh yeah!" replied the Manager irritably. "I suppose that you are the little Moses who is so transcendantly brilliant that you could lead us out of the wilderness. Perhaps you could give the answer."

"Naturally. Any child who has a father not in the utility business could do that. Maybe even I will do so at another time, although it won't do any good; you won't listen or believe. Well, good-bye."

"Here, you come——"

"Got to go. Going to meet one of my fellow members of the Audobon Society who thinks he knows where the floating nest of a water ousel is caught in some driftwood under the Seventeenth street bridge."

Codes in Operation + + +

[Practical and significant suggestions from the code authority chairmen of this territory telling how to make code operation effective]

Economy, Simplicity, Found in Central Bid Depository

BOTH in personal comments and in public utterances, Major Robert Nelson Campbell, deputy administrator for the Construction Section of N.R.A., praised the initiative and the evident cooperation which had produced the first central bid depository in the nation in San Francisco. Patterned after it, he said, there is another being started in Birmingham, Ala., and from the pattern will spring many more. He declared the plan and its operation ideal to secure, at the least cost, the best results from operation of the construction codes.

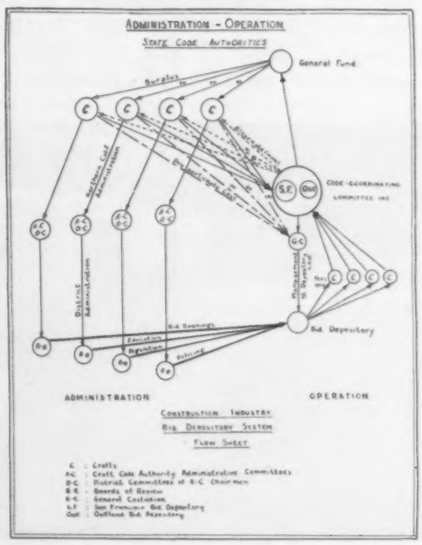
From this endorsement by so important an authority, given in a public meeting of all code agents and authorities from all parts of northern California, during Major Campbell's trip through the West, there has come a request from Fresno, Bakersfield, Sacramento, Santa Rosa, San Rafael, San Jose, and Palo Alto for the establishment of similar bid depositories under the central system which has come into being for northern California, with headquarters in the San Francisco depository. Oakland has also started a depository of a similar nature.

The central depository system is the result of a real need, discovered by the "Code Coordinating Committee," first set up temporarily in San Francisco among the code agents and authorities of the region. This code coordinating committee was later sanctioned by the Construction League of the U. S., the association which sponsors the construction industry codes. Lloyd Flatland, chairman for the 12th region, code authority for the electrical contracting division, the temporary chairman of the committee, has been authoritatively recognized by the League as the president of this code coordinating committee.

All construction industry divisional codes, as well as the master code, call for the filing of duplicate bids. It was found in practice, however, that the fees allowed in the codes to pay for the filing, tabulating, and required handling of bids by each craft were insufficient. Obviously the best solution was to pool together this work in a central bid depository, supported jointly by the fees from all of the divisional codes, and effecting an economy through the elimination of duplicating costs of rent, furniture, facilities and staff. Out of such a plan also would come a more harmonious inter-relationship between the various groups in the construction industry. The plan has in its favor not only economy, but simplicity, neutrality, convenience, and better public acceptance.

A sub-committee, headed by Tom Harris, chairman of the first district, 12th region, electrical contracting code authority, worked out the details for such a central depository. As it has developed, the idea has grown to the establishment of a depository system for the northern California area. But also, because the idea is one which, as Major Campbell recommended, should be used in other areas and regions, full details of operations and methods, together with forms for application, agreements, incorporation of the code coordinating committee as the administering agency, and other details, have been prepared by the custodian, R. A. Daddisman, and can be obtained from him. Indeed it is to his organizing skill that the entire plan has been worked out in every particular.

"Flow Sheet" showing responsibility and financing of central bid depository



How Depository Operates

A brief account of the operation of the central depository in San Francisco will give an idea of its application to other areas. Here the depository was fortunate in obtaining a large auditorium with a mezzanine floor equipped with partitioned offices. It is located in the Sharon building, 55 New Montgomery St. The depository itself has been set up in the center of the main floor. It consists of a counter enclosure, inside of which, visible from all sides, are the necessary furniture and files.

One side of the counter has been especially constructed to contain a number of large and small locked drawers. The large drawers are divided into numbered compartments to correspond to the slots in the counter above. (See illustration.) For the major divisions of the construction code, large drawers are provided, and for smaller divisions, with less bidding, individual drawers. The slots are so cut in the counter that a bid envelope dropped will go to its corresponding compartment, or in the case of small divisions, to the specific drawer belonging to that code division.

Access to these drawers is only possible by a duly authorized member of the code administrative committee for that industry. Each craft is provided with a bid envelope (see illustration) of a distinctive color. The bidder fills out the information required, brings a copy of his bid to the depository sealed in it. The custodian or assistant checks the bid envelope to see that it has the required information, and that it corresponds to the card file of jobs maintained by the depository. Both the envelope and detachable tab are time stamped, the registration number is put upon it, and the tab torn off and given to the bidder for his receipt. The original bid, also in a sealed envelope, is also brought to the depository and is stamped on the back with a

special NRA stamp which commits the opener of the bid to accept it under the terms of the construction code. Then it is delivered to the awarding authority before the set closing time.

Fees for filing are paid in the form of stamps in denominations of 25 cents each. These are sold in books of 40, either at the depository or by the association of contractors to which the bidder belongs. When the depository was being started the associations underwrote it by buying a quantity of these books of stamps, which they resell to their members. The required number of these fee stamps are pasted to the duplicate bid by the bidder before sealing it.

Duly authorized code administrative committee officers open the drawers when bids are closed, give a receipt to the custodian for the bids received, retire to one of the officers to examine and tabulate the bids. The custodian then checks this tabulation and sends a copy to all bidders. Illegal or irregular bids are then called to the attention of their own construction division administrative committee for the procedure recommended by that agency.

The filing fees collected are also designated by N.R.A. to help support the clerical and office expense in connection with the individual code agencies, so a proportion of the filing fee is paid back to these agencies. The administration and operation "flow sheet" illustrated herewith, shows graphically the relation, both financial and administratively, of the regional or other code authorities to the central depository.

It is also planned in the San Francisco depository to rent space around the outer walls of the large room to manufacturers for building material exhibits, since the constant stream of their customers—contractors of every kind—to the depository, makes this a favorable spot for such exhibits.

A library of codes, interpretations, explanations, and data pertaining to them is also maintained for the benefit of the industry.

CENTRAL ASSESSMENT COLLECTING

Another important need that was uncovered by the code coordinating committee was that of establishing some central means of collecting assessments for code activity. Each of the craft divisions of the construction code have a different basis and method of assessment. Many of these have proved very unsatisfactory in actual practice.

Among such is the electrical contractors code assessment system, which calls for direct payment of an assessment of a percentage of productive labor cost to the national code authority in New York City. This method relies too greatly on the individual honesty of the contractors and of their respect for the code. As a result collections of assessments have lagged months behind the expenses of administration. This makes one of many vexing problems which have caused hardship to those who have given so much of their time and effort to code administration, only to find their hands tied because of lack of funds to pay for necessary clerical work or supplies.

To finance more effectively and positively the activities of the code authorities and to prevent their eventual disintegration because of lack of support, a more localized, and better supervised collecting system for assessments is needed.

It has been proposed by this code coordinating committee that a central assessment bureau be established in conjunction with the bid depositories. The assessments would be collected locally, and the proportion designated to be retained by the local agency for its operation deducted and the balance sent to the national code authority.

As it is, active areas carry those which fail to pay assessments. With this localized collection there will be less loss of collections. More effective code enforcement would obtain, since the local code agents would have immediate access to records which would indicate whether a bidder was in violation of his code for non-payment of assessments. There would be stopped the long and fruitless arguments over whether construction work was being let to code violators who "chisel" out of paying fees or assessments.

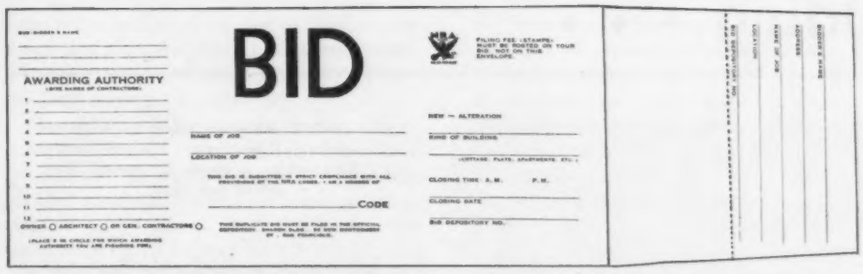
The full collection of assessments would provide necessary funds for proper administration and enforcement. Attorneys fees, expenses incurred in performance of code work would be cared for properly. It is not fair that one business man, a code agent or administrative committeeman, be asked to take out of his own business this expense just because he has been good enough to accept a responsibility from his fellows. He has already given more than his share to the benefit of his group. If the multitude of assessment systems and methods were simplified and assigned to local collection, this code coordinating committee feels, the codes could be properly financed and operated.

Summarizing the advantages offered by the central bid depository system, Lloyd Flatland cites the following:

1. A neutral zone for the filing of duplicate bids.
2. Accurate and verified information as to closing time, correct address and name of awarding authority.
3. Both the bid and the duplicate time stamped so that there can be no

Below: Front of the depositing counter, showing numbered slots assigned to each code division. Behind the counter can be seen the card file, desks, and equipment of the custodian

Below: Rear of the depositing counter showing the numbered-compartments of the locked filing drawers. At upper right is seen the stamp. Just back of the counter is a glass covered shelf. Under the glass are put such notations regarding filing as are pertinent to the particular craft whose filing slots are on the counter in front


BID

AWARDING AUTHORITY

NAME OF JOB

LOCATION OF JOB

CODE

NEW — ALTERATION

KIND OF BUILDING

CLOSING TIME A.M. P.M.

CLOSING DATE

BID DEPOSITORY NO.

OTHER ○ ARCHITECT ○ OR GEN. CONTRACTORS ○

Envelope used for filing duplicate bid. Names of awarding authorities to whom the bid is being submitted are written at the left. The perforated tab on the right is torn off and retained as a receipt by the bidder. The custodian time-stamps both receipt and envelope

doubt as to filing before the required closing time.

4. A receipt for the deposited duplicate bid, which will avoid errors or argument later.

5. Supervision of procedure by an impartial custodian well versed in code requirements and interpretations.

6. A complete tabulation of all bids sent to all bidders participating, with a notation on this tabulation as to any irregularity or non-compliance.

7. A library of all codes, explanations, and data, the latest obtainable, for ready reference.

8. Economy in cost of code operations and activities through sharing of expense with other code divisions in the same area.

9. Better inter-relation of various code activities of the construction industry in each locality, and genuine cooperation many times in obtaining better compliance from a recalcitrant awarding authority, contractor, or subcontractor.

And with a further development along the lines of a central local assessment bureau, he feels that the construction industry can make its code not only work, but work effectively and smoothly, with a fair return to contractors, suppliers and the public.

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Mayer Presented McGraw Medal for Contractors

Leo E. Mayer, president of the White City Electric Co., of Chicago, as well as of the National Electrical Contractors Assn., was presented the James H. McGraw Contractor-Dealer Medal for 1934 at a meeting held Feb. 13 at Chicago. The meeting was sponsored by the executive committee of the National Electrical Contractors Assn. and the Code Authority for the electrical contracting industry which had been in session in that city at the time.

In the citation to Mr. Mayer it is stated that the medal is given to him in recognition of his contribution to the advancement of the contractor-dealer branch of the industry through his constructive leadership in the development of the electrical construction code and the organization of this group for self-government under that code.

The committee of judges which awarded the medal to Mr. Mayer consisted of Clyde L. Chamblin, of California Electrical Construction Co., San Francisco; D. B. Clayton; J. A. Fowler, Gerry M. Sanborn and Earl N. Peak.

NATIONAL RECOVERY ADMINISTRATION
Washington, D. C.
Humboldt Bank Building,
785 Market Street,
San Francisco,
California.
January 21
1 9 3 5

Mr. Lloyd Flatland,
12th Regional Chairman,
Electrical Contractors Code Authority,
1899 Mission Street,
San Francisco, California.

My dear Mr. Flatland:

I am very pleased to inform you that after hearings held at the District Attorney's office, at which time you were present, it was definitely decided by the District Attorney that should anyone in the Electrical Contractors Industry wilfully and intentionally violate the code, they would immediately proceed with prosecution. I have no hesitation in saying that this will be our attitude also, and this office will give you every assistance to put into force and effect any recommendations made by your Regional Committee.

You are at liberty to give this letter any publicity amongst your trade that you may deem advisable for I feel that members of the industry should now definitely know that this office no longer has any hesitancy in obtaining compliance by prosecution if necessary.

May I also call to your attention the fact that the Regional Council has been established since January 1, 1935, with offices here in San Francisco. It will be the function of this Council, in cases that are properly presented, to recommend to the Regional Director, Mr. Donald Renshaw, the removal of the Blue Eagle, and to refer them to the District Attorney for definite prosecution and action. I do not believe it advisable for me to mention any names but in line with the recommendation of your Regional Committee I have already prepared a case for the attention of the Council and you can rest assured that the member of your industry complained against will soon hear from the Regional Council.

Very truly yours,
JAMES E. PRISIN-ZANO,
Legal Adviser.

State License Suspended For N.R.A. Violation

Accused of violating the State law, or CRA, which upholds the NRA code of fair competition for the construction industry to be a State law as well, an Oakland general contractor had his State contractor license suspended for a 30-day period by the State of California Contractors' License Bureau. Charges were brought against C. W. Leekins, general contractor, by the Alameda County Electrical Contractors Association, the local administrative committee of District 1, Twelfth Region Code Authority for the electrical contracting industry and Herbert K. Schultz, inspector, for the State's License Bureau.

The general contractor was accused of attempting to persuade the Parkhurst Electric Co. to cut a $100 from a bid for electrical work which had been filed and closed. When the Parkhurst Company refused, the work was given to another electrical firm at the low figure. The specific charges were made of violation of Chapters 1 and 6 of the Construction Industry Code, under Section 9, Paragraph 10 of the State Contractors License Law which has to do with willful acts to injure a competitor. Great interest was manifest in this case by the entire construction industry of the San Francisco Bay area as it definitely established the cooperation of the State department in the enforcement of NRA Codes.

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• PRIOR to his trip to Chicago to attend the executive committee meeting of National Electrical Contractors Assn., Lloyd Flatland, president of the Northern California Chapter and 12th Region chairman, Code Authority, called a meeting of the district chairmen of the 12th Region at Fresno Monday and Tuesday, Feb. 4 and 5. At the meeting were discussed all of the current problems of code administration. Mr. Flatland stopped at Phoenix, Ariz., on his way east to confer with B. F. Carter, chairman, 9th district.

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Neon Sign Group Organized in Bay Region

A neon and electric sign association of northern California, brought into organization to take advantage of the NRA code recently approved for that industry, was brought into being, with offices in San Francisco, recently. Offices are in the Marshall Square Building, 1182 Market St., San Francisco, where A. S. Whitmore, Wonderlite Neon Products Co., is secretary.

Six sprinklers were used to irrigate 15 acres of pasture. Moved every 12 hours the system irrigated 1½ acres per day

Test Proves the Practicability of Summer Irrigation in Northwest

By C. J. HURD
Agricultural Engineer, Mountain States Power Co.

TO encourage the use of supplemental irrigation where the average annual rainfall is in excess of 75 in. might at first thought appear foolish. However, when the precipitation chart is studied and it is found that from May until September, less than 4 inches of rain falls, and this rain is so well distributed that each shower is of little practical value, then electric irrigation does show promise. Such is the case in a portion of the Mountain States Power Co. properties in Oregon.

Tillamook and Coos County bordering on the Pacific ocean are preeminently dairy and dairy products districts. According to the latest census report these two counties with some 1,142 dairymen reporting, the value received from dairy products sold was nearly $3,000,000. This represents an average annual income from dairy products of over $2,600 per farm. These farms are individually or family operated, with an average of about 20 milk cows per farm. The majority of the farms are owned by the operators, and they produce nearly all of the dairy feed. Pasture is of course the cheapest feed that can be produced, and a very familiar and picturesque scene is that of the dairy cows, Jerseys predominating, grazing on the native white clover and other wild grasses.

These pastures during the summer season fail, and they must be supplemented by the feeding of root and hay crops. This requires several hours of hard labor on the part of the dairyman every day and despite all this, the milk production drops.

Irrigation was the logical thing to bring back the grass and clover pastures during the dry season. However, so intrenched were the dairymen in their existing methods of summer feeding, coupled with the fact that irrigation meant an expenditure of cash, made it hard to convince them to try irrigation. The county agricultural agents and the State College specialists were anxious to introduce irrigation in these counties, but were stopped by the equipment problem.

In 1933, the Mountain States Power Co. offered to enter into a cooperative project, whereby the company furnished the equipment for a progressive farmer in each county and the county agricultural agent was to oversee the installation and keep accurate production records. The agreement made with the owner was that the equipment would be operated and maintained at no cost to him for a two-year period. At the end of that time, if the records showed that irrigation was a profitable investment, he was to purchase the equipment.

In Tillamook county, the farm of Alois Weber was selected. A total of 15 acres of clover pasture was fitted for irrigation, 8 of which was Ladino clover, the balance native grasses. A 5-hp. pressure type centrifugal pump was used and the water distributed by revolving sprinklers. This type of irrigation was used due to the fact that the ground was uneven and not suitable for leveling. The total cost of the installation, including the labor of installation was $1,050.

The results were outstanding. Mr. Weber found that the 15 acres of pasture provided ample feed from May until September for 45 cows. These are the months that normally feed must be secured by using hay, and root crops. Since only 15 acres were required for feed production, the balance of Mr. Weber's 70-acre farm could be devoted to production of hay crops for the winter season. For the first time Mr. Weber found it possible to produce all of the hay used for the entire year on his own farm. In previous

This 5-hp. pumping installation provided sufficient water for the 15-acre pasture and this year will irrigate an additional 10 acres

years so many more acres had to be used for pasture that it was not possible to grow a sufficient quantity of hay to last during the winter.

In addition to a substantial reduction in feeding cost, a decided increase was shown in butterfat production. Mr. Weber's cream checks showed an additional 1,349 lb. of butter fat over the previous year, netting him $407.70. His irrigation cost amounted to only 85 cents per acre per month or a total electricity cost of $63.75 for the season, leaving him a net profit from increase in production due to irrigation of $343.95. This one factor alone will soon pay for his irrigation installation. Is Mr. Weber satisfied? He certainly is! Next Spring he plans on an additional 10 acres of irrigated pasture which incidentally his present pump and motor will be capable of handling.

A field day was held in September by the county agricultural agents in both Coos and Tillamook counties. More than 70 dairymen turned out and from the enthusiasm and interest shown, every indication is that many will install irrigation plants. Already four have purchased outfits and the rural department expects a busy time next spring assisting many others in their equipment problems. This is another good example of what electricity can do to better the economic conditions of our rural customers.

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Soil Heating Cable Used For Inexpensive Brooder

By G. L. BLANCHARD
Agricultural Specialist
Southern California Edison Co.

FIVE experimental installations on southern California poultry ranches using soil heating cable as a source of heat for brooders have produced such excellent results that this new application appears practical and also to offer certain advantages over conventional brooders. As these installations have only been in use one season, their operation should be checked over a longer period before making unqualified recommendations for their use under all climatic conditions.

The experimental installations included outdoor brooders as well as those installed in the conventional poultry or brooder house. Soil heating cable was laid on the floor of the brooder and covered with litter. Advantages of this type of construction were as follows:

1. Adequate, uniformly distributed heat.
2. Heat only applied in the hover.
3. Flexibility of temperature.
4. Ample, no-draft ventilation.
5. Dryness of litter.
6. Safety from fire hazard.
7. Ease of operation and convenience in cleaning.
8. Economy of construction.
9. Economy of operation.
10. Sufficient room for chicks.
11. Ample sunlight in and around hover when outdoor type is employed.

For a 3x15-ft. brooder space having a capacity of 500 baby chicks, 60 ft. of No. 19 soil heating cable was used on a 110-volt service (120 ft. would be required for 220 volts). The cost of the entire electrical equipment including thermostat, cable, switch, lights and wiring was approximately $10. All of the equipment can be easily and quickly installed by the owner.

Operating costs of the installations were low, perhaps on account of the mild climatic conditions. In the outside type brooders the sun took care of most of the normal daytime heating requirements. Assuming that the installations operated 10 hrs. per night, the cost per month on a 2-cent rate was as follows:

60 ft. of cable at 400 watts per hr. .....4 kw.-hr. per night
30 days at 4 kw.-hr.....
.....120 kw.-hr. per month

At a 2-cent rate the operating cost would approximate $2.40 per month for an outdoor brooder having a capacity of 500 chicks. This is equivalent to ½ cent per chick per month, or well within the range considered economical by poultry raisers.

Rural Surveys Show Unserved Customers

Sponsored as a CWA project by the University of California, a survey of 14,185 farms in six counties revealed that less than 10 per cent were not served by electricity. Data obtained included lighting, cooking, heating and ventilation electrical applications.

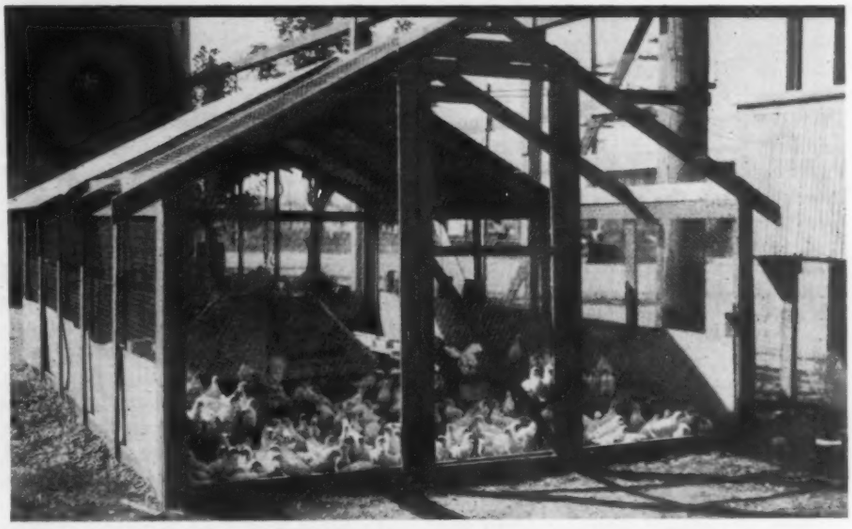
Cooking facilities reported in the homes surveyed were as follows:

	*Number	*Per Cent
Wood or coal stoves	10,567	74.5
Kerosene or gasoline stoves	3,513	24.8
Gas stoves	2,343	16.5
Electric ranges	2,845	20.1

* Discrepancy due to homes having two types of stoves.

On refrigeration the survey showed that 4,975 homes, or 35 per cent, were equipped with ice refrigerators and 1,798 or 12.7 per cent, had mechanical refrigerators. Results indicate that there is a considerable market for both electrical ranges and refrigerators in the rural areas of the six counties.

One California utility has completed a survey of unserved business within one mile of its lines, divided into groups of ¼ mile or less, ¼ to ½ mile, ½ to ¾ mile and ¾ to 1 mile. This survey shows 5,140 consumers unserved or 0.79 per cent of the total customers. To serve these consumers would require approximately 2,000 miles of distribution line, with an average customer saturation of 2½ per mile. The same survey showed that there were 1,502 gas or Diesel engines operating within a mile of existing lines, with an estimated total capacity of 15,000 hp.



Open Air Electric Brooding Gains Popularity

Contrary to the opinion held by some poultrymen that chicks should be brooded in air-tight houses, experiments conducted in California have demonstrated that an abundance of fresh air is highly desirable. Here is an outdoor brooder house equipped with an electric brooder that did a satisfactory job for the Rio Linda Poultry Producers. The brooder is of the conventional type. The experiments proved that plenty of fresh air with heat when needed reduced mortality

In the Realm of Science + + +

[Devoted to the research and scientific developments which affect the electrical industry and which are being carried on in the engineering departments of Western universities. Edited this month by Professor E. A. Loew, Electrical Engineering Dept., University of Washington.]

Something new in illuminated signs —a high-intensity luminous tube that widens the field of decorative lighting

Research Develops High Intensity Luminous Tube Light Source

WHILE luminous tubing has been used in display lighting and advertising signs for a sufficient length of time to become commonplace, it is not generally realized that during the past ten years, particularly, there has been much evidence of feverish activity in research laboratories directed continually toward the improvement of these lighting units. It is unfortunate, however, from the standpoint of scientific progress, that the tremendous efforts that have been made by the many experimenters both in the United States and abroad, have been shrouded in secrecy and that the knowledge gained has been so jealously guarded. The absence of cooperation in the exchange of ideas by the many research organizations dedicated to this new line of investigation has retarded considerably the possible progress and has laid a foundation for serious future conflict because of possible interference in the many highly involved patents that have been issued to experimenters.

Notable progress has been made nevertheless. In the Seattle laboratories of the Electrical Products Corporation, Prof. F. K. Kirsten of the University of Washington has developed the Kirsten "High-Tensity" luminous tubing, a form of luminous tube lighting that represents a distinct step in advance of the art.

With the introduction, some years ago, of luminous gaseous tubes, popularly known as neon tubes, a new stimulus was given the lighting art. An important characteristic of this form of tubular illumination is the absence of any point source of light. Accordingly, there is no glare and hence no necessity for extraneous means for diffusing the light, for it is already diffused throughout the tube. Neon tubes as commercially known and used primarily in sign illumination, however, have too low an intensity of illumination to make them entirely satisfactory. Unfortunately, the intensity in these tubes is definitely limited by the physical and electrical characteristics of the tubes themselves.

As a result of Prof. Kirsten's investigations, and after three years of work, a luminescent tube has been developed that is similar in appearance and in color to the conventional neon tube but has many times its brilliancy. Among the important claims made for the new tube is that its brilliancy is twenty-five times as great as that of the older unit. When used on street signs, the outstanding brilliancy of these new tubes adds greatly to their advertising value, for signs can be seen clearly and read at much greater distances than formerly.

The first commercial installation was a large display sign installed for the Roxy Theatre in Seattle. All of the tubes used, being charged with neon, gave an extremely brilliant display of red light that could be seen to stand out in extraordinary prominence above other display signs in the vicinity. The second large display sign to be installed was that of the Fifth Avenue Theatre, a display sign of blue tubing that is easily the most beautiful lighting exhibit along the entire length of Fifth Avenue. Photographs of typical installations are shown in the accompanying figures.

It was not long after the first installation was completed before a considerable demand developed for this new advertising medium not only in Seattle but in other cities and states as well. At present there are plants producing this new tubing in Seattle, Salt Lake City, Denver, Vancouver, B. C., Australia and New Zealand. The business of producing these new tubes has developed into an industry of considerable proportions.

Fig. 1. shows the construction details of the arc tube together with the electrical circuit which energizes it. The ends of the luminous tube are slightly enlarged to accommodate the electrodes which consist, each, of a cathode (electron emitting) and an anode, which at the same time serves to prevent excessive heat radiation from the cathode. The cathode consists of a spirally wound, thin metal ribbon, treated with an alkali oxide and electrically heated by an energy supply from the transformer. The transformer is specially designed with a magnetic shunt so as to give the secondary circuit a reactance of such magnitude that the short-circuit current of the secondary is only slightly larger

than the normal operating current. The filament heating coils, which are a part of the secondary circuit, are not subject to the influence of the magnetic shunt so that the cathode energy is independent of the circuit characteristics of the secondary.

Upon closing the switch, the cathodes are immediately energized and brought to incandescence within the time of a second. Violent electron emission

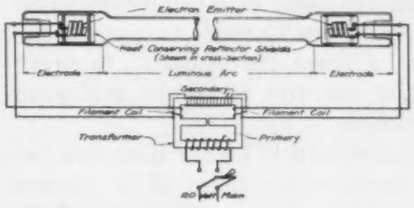


Diagram of the Kirsten "High-Tensity" luminous tube which has many times the brilliancy of conventional gaseous tubing

from the cathodes immediately kindles the arc between the electrodes. It will be noted that no time-delay relays are used in this simple circuit. This fact is responsible for the low maintenance cost of the luminous tubing installations of the Kirsten "High-Tension" system. Some of this luminous tubing now has been in operation longer than 7,000 burning hours.

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Periodicity Analymatograph Aids Study of Curves

ONE of the chief objects in a study of statistical curves is the prediction of future trends. An outstanding branch of this work is the estimation of the future water flow in certain rivers which are being considered as power sources.

It is evident that a curve which repeats itself in successive intervals has its future completely determined as a repetition of its past behavior. Such a curve is known as a periodic function. The interval in which the curve repeats itself is termed the wavelength. If several of these periodic curves, having various unrelated wavelengths, are added together, a complex curve is otbained which usually is not periodic; that is, no two parts of it are alike. A graph of river flow is an example of this type of curve. The flow of a river is seen to be the result of many periodic factors such as the rainfall on different parts of its drainage basin, the annual melting of snow, and the variation of the sun's heat emission.

Since the hydrograph of a river is the type of curve described above, it should be possible to analyze the curve into its periodic components. Each of these components can readily be extended into the future since they repeat in consecutive intervals. This is, of course, equivalent to extending the hydrograph since the future extentions of all the components can be added to give a prediction of the coming trend of the river flow.

The Periodicity Analymatograph is a photo-mechanical instrument devised by Siegfried Hansen and George K. Barger, graduate students in electrical engineering at the University of Washington, to simplify periodic analysis. Use is made of the principle that a periodic component in a curve may be detected by cutting the curve into equal pieces whose length is the wavelength of the suspected periodic component. These pieces are superimposed and their average form is found by adding corresponding ordinates in all the pieces and dividing by the number of parts. If the suspected component is not present, the average form will approach a straight line; but if a component is indicated, its waveform will be that of the average curve derived as described. The Periodicity Analymatograph carries out this cutting and averaging process for all possible wavelengths simultaneously. Thus all the components of a curve are determined in one operation. This saves much of the time and tedious computation involved in the cut-and-dry process formerly used.

By this process, the use of harmonic analysis may be extended to certain types of non-periodic functions, since their periodic components can readily be analyzed into harmonics. This is a useful tool in the study of complex vibration in machinery.

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Two Programs Broadcast Simultaneously on One Carrier

WHILE it has been known for a long time that intelligence could be transmitted over a radio wave by varying or "modulating" the frequency instead of the amplitude of the wave, little commercial use has thus far been made of frequency modulation, in spite of its evident possibilities. This condition has been due primarily to the lack of suitable devices for modulating and demodulating the wave. With the object of supplying this need, preliminary investigation was started at the University of Washington in 1931. The results of this preliminary work were described in an Engineering Experiment Station bulletin which, it is believed, contains the first published experimental verification of the side-band analysis of a frequency modulated wave.*

The problem of a suitable modulator was solved very satisfactorily by a device developed at the University by Messrs. John Woodyard and E. O. Scott, making use of an artificial transmission line as an impedance rotator. By using a line one-eighth of a wave length long and placing the variable plate resistance of a vacuum tube at one end of the line, the other end of the line can be made to act as a variable reactance across the tuned circuit of an oscillator, thus accomplishing frequency modulation. The theory of this modulator has been described by Eastman and Scott.†

Several new ways of accomplishing demodulation were developed before a satisfactory device sufficiently simple in operation to be practical was found. A method is now being used which requires only the addition of one tube to present receivers and yet responds to a far smaller amount of frequency modulation than previous methods. This demodulator was made possible by the discovery of a simplified method of shifting the phase of an incoming carrier frequency while leaving the phase of the associated side bands unchanged. The present frequency modulation receiver does not respond to amplitude modulation, except for small distortion components, even when the percentage of amplitude modulation is large, which makes possible duplex transmission on the same channel.

By sending out two different programs simultaneously from an experimental transmitter, on the same carrier frequency, one amplitude modulated and the other frequency modulated, it has been proved that it is feasible to select either program desired at the receiver. If commercially practical, the use of frequency modulation would thus double the available space in the broadcast spectrum. Tests indicate that there is no theoretical limit to the quality of reception obtainable with frequency modulation.

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• UNIVERSITY OF CALIFORNIA facilities will be made available for private research, according to announcement made by President Robert Sproul, provided the university is compensated and facilities for needed investigation do not exist elsewhere. The policy announced was that the university would not enter controversial investigations except at the request of all parties. Neither is the name of the university to be used in advertising the products of research.

* E. D. Scott and John Woodyard, "Side Bands in Frequency Modulation," Bulletin 68, Engineering Experiment Station, University of Washington, Seattle, Wash.

† A. V. Eastman and E. D. Scott, "Transmission Lines as Frequency Modulators", Proc. Institute of Radio Engineers, Vol. 22, p. 878, July (1934).

EDITORIAL

MARCH, 1935

Water Law Clarified

WHEN California's Supreme Court held the doctrine of reasonable use to be constitutional last month a new chapter was written in Western water law. Beneficial development of water resources in the future seems assured, and the costly and interminable litigation of the past will not occur again.

Since the halcyon mining days of '49 California water law has been based on the doctrine of riparian rights whereby the riparian owner could demand "undiminished stream flow" through and over his land regardless of his ability to use the water. The result has been waste and costly law suits, which for a time threatened hydro electric power development and the storage of necessary water for irrigation. Seven years ago the state adopted a constitutional amendment designed to correct the injustices of the outmoded riparian doctrine and to permit "water resources to be put to beneficial use to the fullest extent of which they are capable." The present Supreme Court decision settles the constitutionality of that provision.

While past adjudications are not affected because the law is not retroactive, in the future there will be no more Herminghaus cases nor bitterly contested suits such as those brought against the utilities on the Fall, Pit and Feather rivers. Reasonable beneficial use will be assured, whether for power, irrigation or domestic supply. Furthermore the whole trend of Western water law will be clarified, because all Western states now base their law on reasonable use. This uniformity has been needed badly.

An Overlooked Market

BECAUSE the Better Light-Better Sight program tends to emphasize the social and commercial opportunities of selling improved lighting to the store and the home, the equal opportunities which exist in the industrial lighting field are being overlooked by the industry. The emotional appeals which are being used so successfully to win public appreciation of better lighting and its relationship to eye comfort and health can be bolstered with potent practical sales arguments when the lighting salesman approaches the industrial plant. Here are four sales arguments to be employed in developing industrial lighting:

1.—The cost of lamps is lower than ever before in the history of the industry. Expansion of the home market has brought price reductions in the higher wattages. Consequently replacement costs and maintenance have been reduced.

2.—Energy costs are down, which means that operating costs of a modern lighting installation will be lower. Some utilities no longer require separate meters for lighting but include it in the power rates.

3.—Cost of labor per man-hour in the industrial plant is higher than ever due to NRA codes. This means that every effort must be made to increase the efficiency of labor. Figures are available to prove that good lighting is essential to secure maximum efficiency from workmen.

4.—Industrial competition is keener than ever before. To assure himself of his share of the market the manufacturer must modernize every phase of his operation. Modern lighting reduces the penalties for rejects, speeds operations and assures efficiency.

Industrial lighting merits active sales promotion. Additional load and more equipment sales and installation work can be developed by employing such sales arguments as those cited.

Rate Comparisons

WITH the release of preliminary reports on the Federal Power Commission's national survey of electric rates, the fears of some people in the industry over the outcome of the survey seem justified. Without explanation or interpretation, the newspaper reports make invidious and unfair comparisons between rates in various cities for varying quantities of energy. The purpose appears to be to create further popular dissatisfaction and suspicion.

Immediate steps must be taken to offset these newest propaganda efforts. Arguments, both emotional and rational must be marshalled. In the former category is the analogy drawn by the Portland *Oregonian* in a recent editorial, which says:

"It would probably be impossible to find an intelligent person who would argue that because one farmer, advantageously situated as to transportation, markets, climate and soil, can make a profit on 50-cent wheat, 50 cents is enough for all wheat farmers. Yet the electric rate comparers in the public and political forums argue from just as untenable a position."

Factual arguments which explain the rate differences rationally must be clothed in terms easily understandable by the public. Variables which affect the cost of energy to the ultimate consumer include the primary investment in the generating system. If it be hydro, this investment varies between one stream and another depending on storage requirements. Steam stand-by may or may not be required. In

steam plants the cost of fuel is a factor. Transmission costs vary with the proximity of the generating plants to the market. Distribution investment is affected by customer density, local regulations governing line construction and the size and diversity of loads. No two communities or states impose the same rates of taxation.

In comparison between privately and publicly-owned systems, variables include the cost of money; the amount of accounting service, office accommodations, clerical help, technical advice and even labor furnished the municipal utility system at taxpayers' expense; the degree to which the municipal system adheres to sound business practice in setting up reserves for depreciation and obsolescence; freedom from taxation and finally, the fact that municipal systems are relieved from regulatory restrictions and expenses.

There are other arguments equally potent. All of them must be employed and should have been cited in the rate comparisons released by the Federal Power Commission to the public.

A Woman Editor Speaks

WESTERN Furniture Market, with its exceptional displays of new home furnishings and appliances, and the success of its program, has to its credit one fine achievement. If it did no more than to bring Mrs. Anna Steese Richardson, of Woman's Home Companion editorial staff, to the Pacific Coast to give western merchants a clear and refreshing viewpoint, it has done much to bring about a new era of business.

U. S. mails bring to this extraordinary woman some 36,000 letters a year from women all over the country—indeed the world. And these letters give her, as do her lecture tours, an up-to-the-minute picture of what women everywhere are interested in, what they think, what they need or demand for their homes and children.

To anyone, therefore, whose business so much depends upon what these women think and buy, here was one "expert" upon whose every word dealers, utilities, manufacturers should have hung. She was the ambassador from their ultimate consumers. Necessarily brief, but no less pithy, here are some of the thoughts she brought from her constituency:

"We (in business) must fit our trade persuasion (advertising and selling) to a country just coming out of depression, and most of it is not sure yet that it is coming out. The women of the country have become so used to economizing that they are still afraid to spend for fear that there will not be any more money to come. We are accustomed to being shabby, to economizing. Why, we've even made a virtue of it. This is a general feeling that you merchants must overcome."

She told of one of her associates, who had recently returned from a trip throughout the nation. The living room, or parlor, of the home today, she found, was the "forgotten room." The constant advertising done by the electric appliance manufacturers, was causing women to spend any money they had for improvement of the home in the kitchen or bathroom, and letting the rest of the house grow shabby.

An excellent bit of advice Mrs. Richardson gave when she asked why those who had wares to sell did not read the editorial columns of the women's magazines to find out what women were thinking, what they wanted to know about. These columns, she demonstrated, are not the result of guesses as to what someone imagines a woman will be interested in knowing. They are definitely the product of these 36,000 letters, these countless interviews with women in clubs, P.T.A. meetings, travels. Against this direct evidence of women's needs and demands, she showed how silly and far afield is much of the advertising directed at them by manufacturers.

Women no longer believe testimonial advertising employing big names, she assured her listeners. She warned not to insult a woman's intelligence by patronizingly gushy copy, or fantastic, exaggerated claims. "God help you if you get women laughing at you," she emphasized.

A new automobile, she said, gives a woman a certain amount of prestige, since her neighbors cannot very well avoid noting it. The problem is to endow the home with the same prestige-bringing quality, she said, and this can only be done by suggesting that a woman can improve her own appearance and prestige in creating for herself the proper background—the home, its furnishings, its equipment to make her work lighter. There is a pregnant thought for lighting promotion in this. It should be emphasized what good light will do to improve the woman's home background, the setting in which she wishes to be the central figure. There is fine advice for everyone in what she has been telling women's audiences throughout her tour of the country, too:

"I feel that the most important effort for American woman today is to help business recover. She should stop knocking big business and creating suspicion of our business firms. With a steadily increasing national debt, bad business conditions, and continued relief work, the government will pile up taxes for her children and her grandchildren to pay. She should remember it is far better to give men work than relief checks."

Significant Trends + + +

[*Signposts which point the road to improved business or method, brief, pertinent, useful hints as to HOW someone has blazed a new trail*]

Triton Produced by New Refining Process

Outdoor Electrical Installation Feature of New Development of the Union Oil Co. Which Extracts Pure Paraffine Base Lubricating Oil From California Crudes by Refrigeration of Solvent Refining

RECOGNIZING some years ago that the rapid advance in automotive design would require improved lubricants, the Union Oil Co. instituted a research development program to discover how such a lubricant could be developed and produced commercially. Underlying the investigation was the fundamental premise that both Eastern and Western crudes include the bases of the most desirable paraffinic type of lubricant.

So well has the general public been educated to believe that the so-called paraffine base crudes produce superior lubricating oil that Eastern oils have enjoyed a steadily expanding sales volume in the West at the expense of lubricants produced from Western crudes. It is logical to assume that all crude oils contain the same hydrocarbon constituents, although the quantity of each may vary considerably in various types of crude. Eastern crudes, however, contain a higher percentage of paraffinic lubricants than do crudes produced in Western fields. Western crudes, and California crudes particularly, have in the past been considered essentially asphaltic base in character but it was discovered that in addition these crudes did contain a small portion of the fractions from which the highest grade lubricants could be made.

Union Oil Co. recently completed a $1,500,000 plant at Oleum, Calif., embodying a new process by which all of the asphalt, wax and other undesirable components are removed from California crudes, leaving only pure paraffine base fractions of the highest quality lubricating oil which is being marketed under the trade name of Triton.

Briefly, the process consists of five general steps: The vacuum distillation, propane deasphalting, propane dewaxing, double selective solvent refining, and finishing for uniformity of color and grade. The vacuum distillation unit is similar to the conventional type with the exception that extremely high vacuums are maintained to take off the desirable lubricating oil fractions as an overhead cut.

...in Western Manufacturing

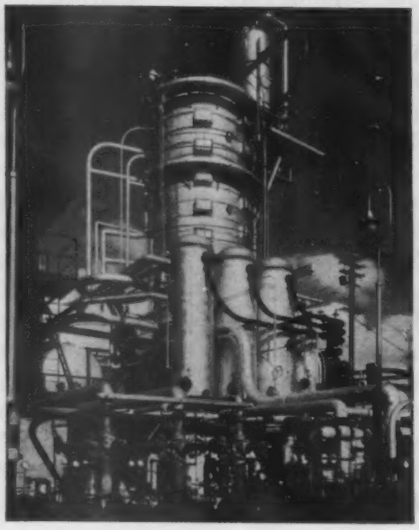
Probably the most interesting unit of the new plant is the propane unit, the first step in which is the removal of asphalt from the oil. In this process the lubricating oil stock is mixed with liquid propane under a pressure of 175 lb. per sq. in. at a temperature of 100 deg. F. Under these conditions all fractions of the stock are soluble in propane except the asphalt which settles to the bottom of the vessel and is drawn off as a semi-solid. Some of the lowest grade oils also come off at this point.

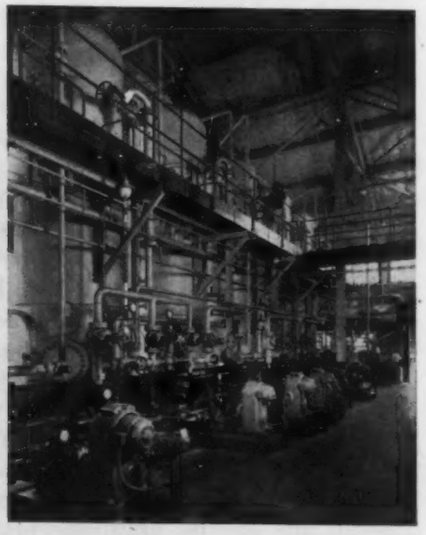
In the next step the mixture is pumped into vessels where the pressure is gradually released, under which conditions the propane, because of its extreme volatility evaporates rapidly and produces a temperature of between —40 and —50 deg. F. at which the various waxes in the solution solidify and can be removed by filtering.

After filtering the stock still contains low grade oil along with the pure paraffine base lubricants. It is therefore passed through a solvent refining process in which it is treated with liquid sulfur-dioxide and benzene. All of the remaining undesirable constituents being soluble in proper proportions of these two solvents, the low grade constituents are separated from the pure paraffine base lubricants. After this process the product is given a final finishing to insure absolute uniformity of color, grade and body. It is then sealed in cans ready for marketing.

Of particular interest is the electrical installation at the new plant. To prevent any possible vapor accumulation, practically all of the refinery equipment operates directly out of doors. Splash-proof motors set out of doors are used to drive the pumps and other equip-

Ruggedness and reliability of modern motors is exemplified in this view of the new vacuum distillation unit of Union Oil Co., the pump drives for which, shown, in the foreground, are set in the open





This battery of motor-driven, variable speed drives in the solvent treating plant is typical of the adaptations which electrical manufacturers are making the better to meet the requirements of industry

General views of the propane unit of the Union Oil Company's plant at Oleum. (Above) In the foreground is the substation and electrical control house from which individual 440-volt circuits are carried under ground to each drive.

(Below) Individual drives plus the use of splash-proof motors for out-of-door installation and a centralized control room provide close supervision of the process as well as economy and ease of maintenance

ment used. Lighting and motor circuits and carried in individual conduits in concrete, each motor having an individual circuit from the plant distribution center which is located in a galvanized iron building adjoining the main transformer bank located a safe distance from the heart of the plant.

At this point incoming 2,200-volt power is transformed to 440 volts and distributed through the main distribution panel upon which are mounted the disconnecting switches and magnetic starters for every motor in the plant. Remote control circuits are carried in the same conduit with the power leads for that particular motor. Two pushbutton stations operating in parallel, one at the motor location and the other at the central control switchboard for the plant, control each machine. In this connection it is interesting to note that all moving parts are housed, which has permitted centralized grouping of the pushbuttons in the operating room of the plant.

Throughout great care has been taken to produce safe operating conditions. When mixed with the proper quantity of air, propane forms an explosive mixture, consequently all electrical equipment, including the lighting, in the plant is necessarily of the vapor-proof type. Four hundred forty-volt distribution and the underground system both contribute to added safety in so far as electrical installation is concerned.

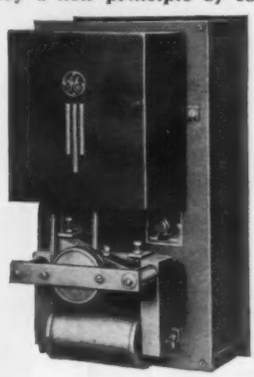
...in Engineering

New Voltage Regulators Incorporate Unusual Designs

RADICALLY new and simple in principle and operation, a new line consisting of four types of exciter-field rheostatic regulators has been announced by the General Electric Co. Two types are for alternating current machine applications and two for direct current machine applications. In all four types there are no vibrating contacts, the voltage-sensitive element being a form of torque motor balanced against a spring and controlled by the generator voltage.

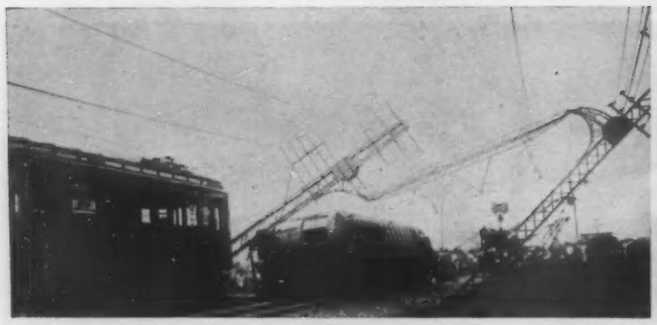
In operation the torque motor assumes a deflection corresponding to the applied voltage and acts against the restoring torque of the spring. The torque motor element remains motionless unless a voltage change occurs when a proportional change in deflection takes place, the response being fast and of flat characteristics with respect to load, frequency and temperature. In the smaller types dashpot linkages prevent oscillation and provide dead-beat operation, magnetic damping devices performing the same function in the larger types.

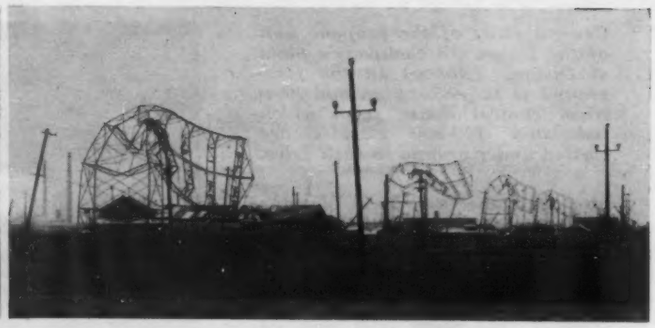
One of the new General Electric rheostatic voltage regulators which employ a new principle of control



The small types are direct acting and employ a rheostatic element of an entirely new construction which provides a smooth change in resistance from zero to maximum in a great number of extremely small steps, the rheostat being operated directly by the torque motor through a simple linkage; the two larger types for a.c. and d.c. machines, respectively, have high speed features and are suitable for any type or size of synchronous machine. Excitation is controlled by automatic adjustment of the exciter-field rheostat and by high speed relays which cut in or cut out the entire regulating resistance in the exciter field only in cases of large voltage changes.

All four types are extremely simple and have remarkably few moving parts. A feature contributing to low maintenance and accurate operation is the fact that all moving parts remain at rest unless there is an actual voltage change. Regulators of this and similar types developed by manufacturers in recent years fill a definite need in modern industry.





Above, left—Curious distortion of trolley supporting structures caused by high wind loading, the force of which is indicated by the overturned interurban car. Right, above and below—Transmission tower failures which occurred during the storm

Typhoon Damages Japanese Utility Structures

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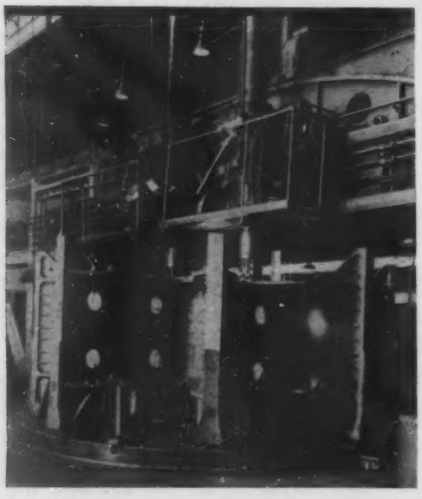
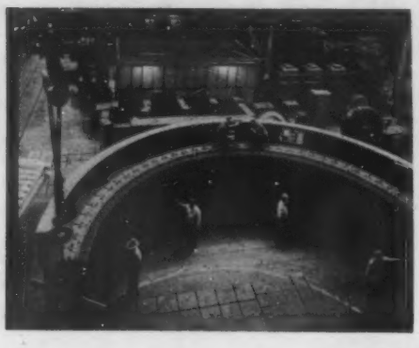
Below,—Distribution poles in Osaka also felt the full force of the wind



Boulder Dam generators near completion. Above—Machining a spider at the Westinghouse shops. Below—A segment of the stator of a General Electric unit

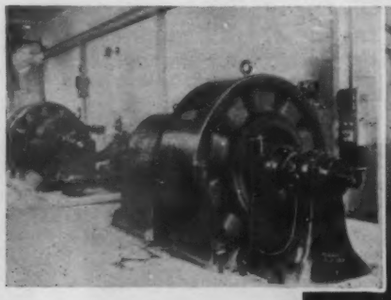


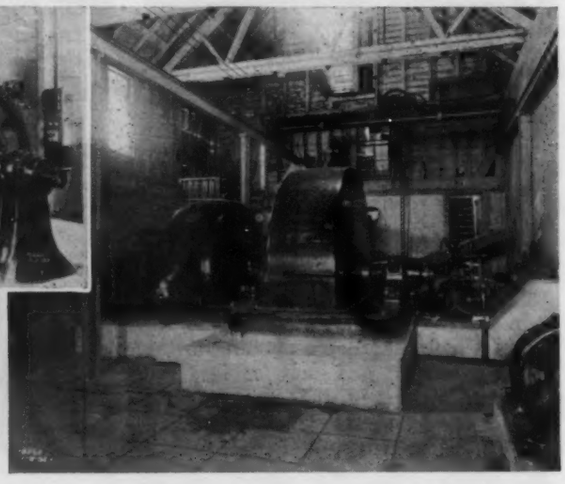
"No. 51" Retired In Plant Modernization

COMPLETING nearly forty-two years of continuous service in the Mill Creek No. 1 powerhouse of the Southern California Edison Co., America's first hydro-electric three-phase generator has been retired from service and replaced with a modern generating unit of greater capacity. The historic old generator, one of the two originally installed in the plant in 1893, will be placed on a pedestal in the original powerhouse, about eight miles from Redlands, Calif.

Bearing General Electric serial nameplate No. 51 and rated at 250 kw., the generator was installed by the Redlands Electric Light and Power Co., one of the predecessors of the Edison company. Its installation heralded the beginning of three-phase hydro-electric power development on long distance lines in America and since it first went into service on August 15, 1893, this same generator has been operated as a unit of the Edison company's hydro-electric system.

Below — The new unit which replaced the three old generators at Mill Creek and almost doubled the output of the plant by using the same water more efficiently





Above — Before reconstruction of Mill Creek Plant. General Electric generator No. 51 in the foreground operated 42 years (1893-1935) before being retired

The reconstruction of Mill Creek No. 1 powerhouse has been under way since February, 1934. The installation of a new generating unit, one formerly held as a reserve unit at Mill Creek plant No. 3, was completed shortly after the first of the new year. The plant was kept in operation during reconstruction, until late in December. This unit was redesigned and modernized for service at plant No. 1.

In addition to No. 51, Mill Creek plant formerly had two other units each of which utilized separate streams of water from one central header. Their total capacity was 640 kw. New efficiency and greater production of electrical energy will result from the replacement of the three old units by one new unit utilizing all the water in one stream giving the plant a capacity of 1,000 kw.

With modern redesigned water wheel equipment necessary to adapt the new unit to new operating conditions and with complete use of all the water in one stream, operating efficiency of approximately 80 per cent will be obtained, as against approximately 55 per cent with the old equipment. With the installation of the new unit and the necessary new and larger transformer and switching equipment, provision has been made for the automatic operation

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Motor Patrol For Fort Peck Line

OPERATING day and night to insure against failure of power supply for the gigantic dredges operating at the site of Fort Peck (Mont.) dam a fleet of seven Ford trucks provides the newest and most modern method of controlling transmission lines. Each truck is especially built and equipped for repair work, including pole derricks, winches, searchlights, steel cables, pole trailers, and special tools.

Modern line patrolmen—A fleet of seven Ford trucks completely equipped for repair and maintenance service patrols the 154-kv. transmission line serving the dredges at Fort Peck dam site

Unceasing vigilance plus these completely equipped patrolments will minimize outages on the 288-mile, 154-kv. transmission line built between Great Falls, Mont., and the construction site.

...in the Motor Shop

Improved Blower for Stump Burning Devised

SAYS R. N. Miller, extension economist, State College of Washington: "Reclamation of the 785,000 acres now farmed in western Washington represents a huge investment in capital and labor. . . . Different authorities have estimated that about 2,000,000 acres of the present cut-over area is potential farm land." He then goes on to say that a cheap but effective stump burner may be made from a vacuum cleaner

Centrifugal blower applied to a stump burning device.

and one 8-point air distributor, 75 to 150 ft. of ⅝- to ¾-in. garden hose, and 150 ft. of ⅜- to ½-inch water pipe in lengths from 6 to 12 ft. In his well-written report on this subject, he describes still other types of burners.

Working along these lines, an inventor by the name of C. Falk, of Tacoma, Wash., has developed an electrically operated stump burner which is shown in the picture. The main thing is to get a fire started in a stump in several different places, force the burning until the separate fires work together, and create a natural draft. Then the device can be moved on to the next stump.

The Falk device consists of a centrifugal fan in a housing. This is driven by a small motor vertically mounted below. Twelve nozzles project from the circumference of the housing to which lengths of hose are attached, so as to work on as many places on one stump or perhaps on several stumps situated close together. On the end of each hose is a 4-ft. length of ⅜-in. gas pipe.

To start the fire, 1-in. auger holes are bored about 20 in. deep in the stump, all pointing toward the center. Crank-case oil is then poured in the holes and on top of that a little gasoline, which is touched off. The end of one of the pipes is then inserted in each hole, and the blast of air causes the oil to burn rapidly. Soon, the oil is consumed, but the wood in the region is blazing freely. The end of the gas pipe being by this time red hot, there is no difficulty in maintaining the fire from then on, and it rapidly eats toward the center. When the fires unite, a strong natural draft is produced which consumes the stump in a matter of hours instead of the days which was required by the old method of trying to burn them by making fires around them.

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Demonstrate Home Shops and Boost Tool Sale

Home wood-work lathes and shop equipment are finding a ready sale these days where a live demonstration is being conducted in the windows to show its uses. Dealers handling such equipment can take an example from the success and the interest shown in such demonstrations held in the Northwestern Electric Co.'s large Sixth Ave. display window in Portland and in the series of such displays held in the windows of the Pacific Power & Light Co. last month.

A skilled woodworker is employed to turn out furniture and other homecraft articles in the window. Contests of homecraft are sometimes held in conjunction with the display, tying in with local clubs of homecrafters.

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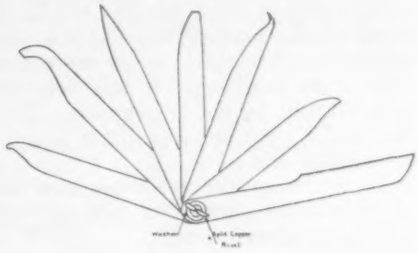
Commutator Cleaner From Hacksaw Blades

CLEANING out dirt and particles of metal from between commutator segments requires working from all sides of the machine, and in many places awkward to get at. No one tool seems to fit the bill. Sharp points, chisel-shaped ends, curved blades, hooks and so on, all come handy.

Nichols Electric Co., Portland, among others, has made a combination tool for this purpose, using old hacksaw blades. Using the end having the hole in it for the handle, the other end has been ground down to the desired shape and assembled as shown into one composite tool. Washers are used above and below and the whole assembly is held together by a split copper rivet.



...in Construction

Graybar Moves Into "Ideal Electric Home"

An "ideal electric building," consistent with the persistent and energetic program of electrification sponsored by its manager, Harry L. Harper, was moved into by Graybar Electric Co., Los Angeles district, on Jan. 1. The new building is located at Second St. and Santa Fe Ave., across the street from the Santa Fe passenger depot.

Interesting is the fact that the building is all electric. There is not a single outlet for gas, oil or other fuel in the building. It is heated electrically, has electric water heaters, and is lighted to 18 foot-candles in the offices and city sales store and 8 foot-candles in the warehouse. Adequate convenience outlets have been placed everywhere. "Here is one case of where the shoemaker is wearing his own shoes," says Harry Harper, Pacific District manager.

Another interesting feature is that the building is the first Class "A" concrete slab type building erected under the new Los Angeles building ordinance and contains 9,000 tons more steel than would have obtained had it been erected under the old ordinance.

Adequate parking space for customers, a two-way loud speaker system, conveyor chutes and facilities are included in the features of the new plant.

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Never Missed a Meal Despite Blowup

An example of what he terms excellent cooperation is told by George Pimlock, electrical engineer for the Tamalpais Union High School at Mill Valley, Calif. This high school is electrically heated and besides has a large installation of electric cooking equipment in the school cafeteria.

Recently one of the heavy cables supplying the service to this school leaked to the ground and then burned up at about 10:30 in the morning just as the lunch was in preparation at the cafeteria. A call to the Pacific Gas and Electric Co. for loan of equipment for a quick return of service brought immediate response. Heavy cables and hardware were loaned to the school by the utility and by dint of quick thinking and hard work on the part of Mr. Pimlock the service was back in time for the cooking of the luncheon. It was delayed only 20 min. by the interruption. The line which went out was a 2,400-amp., three-phase line.

In replacing the cable increase in sized is being planned to take care of additional electric load.

Irving Lassen . . . "not forgetting . . . dog biscuit."

Diversity Helps Contractor's Business

"If you can't be a chain store, try to go them one better", says Irving Lassen, of the Irving Lassen Electric Co., Olympia, Wash. So a lot of things are found to be going on in his place. First, his company is one of the leading contracting firms in Olympia. The construction end of the business is in charge of William Bergstrom.

In the store are to be found a complete electrical appliance repair shop, a bicycle repair department, a department where keys are made, a substantial line of electrical appliances and supplies, hunting, fishing, golfing, baseball and many other lines of sporting goods, not forgetting a well chosen stock of dog biscuit.

Perhaps Mr. Lassen may not appreciate this rather helter skelter mention of his various activities. Nevertheless, that is the impressive thing about the business. It shows an energetic effort to get people coming to the store. And it works. Customers, or maybe for the moment, just friends and acquaintances, like to drop in. All these activities are bound to represent a feeder for the electrical contractor and dealer business.

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Forced Air Makes Economical Heating

VERSATILE, highly efficient, and economical are two unusual installations of electric heating and ventilating recently installed in Portland.

Of the two the most elaborate is one in a frame building owned by Jacobson & Jensen, contractors, on Stanton St., where the three offices on the ground floor, with a total content of 4,607 cu. ft., are heated on 8 kw. Four complete changes of fresh air an hour, taken from outside the building, without lowering its humidity materially, are brought into the building. The warm air, heated by passing over electric elements inside a metal trough, is forced into the rooms through inlets near the ceiling. This forces the cooler air out through window and door cracks, preventing radiation losses. Thermostats are employed to hold the temperature within prescribed limits.

The other installation is in a basement dining room at Hilaire's restaurant on Washington St. This heats and changes air four times an hour in a room of 7,000 cu. ft. content with 7 kw. connected load. A similar method of heating the air is employed. Both installations can be quickly changed into cooling and ventilating plants for summer use.

The design of the apparatus is the result of the cooperative work of A. K. Gaylord, electrical heating engineer of Northwestern Electric Co., U. K. Peterson, Peerless Fan Co., and the Telco Electric Co., which made the installations.

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...in Wiring Rules

Work for State Code in Washington

To defray the expense of preparing and introducing a bill in the current session of the Washington state legislature, providing for a state electrical code, members of the Electric Club of Washington underwrote a fund of $750 which will be repaid by members of the state-wide organization. Active members of the Club were assessed $2; electrical contractors $3 and the remainder is being solicited from supply houses, wire manufacturers and fixture companies. The finance committee of the Electric Club of Washington, responsible for raising the sum, includes: E. E. Bratt, of Eicher & Bratt, manufacturers' agents, chairman; M. P. Hotelling, electrical division, Seattle Building Department, and Joe Wells, Westinghouse Electric Supply Co.

The proposed code provides for the licensing and bonding of persons who make electrical installations. It makes provision for the inspection of electrical work, the cost for which is to be paid for through the license fees paid by the contractors and not in fees to the home owner. Contractors will each pay an annual $50 license fee, which is estimated will bring a fund of about $30,000 to the state. This will be used to defray the cost of inspections and administration of the code.

The National Electrical Code will be required as the minimum wiring standard. According to the wording of the code the approved standards of the American Standards Association are considered as *prima facie* evidence of

approved methods of installation. This will provide for automatic acceptance of new editions of the code as they are brought out and approved by the A.S.A.

In support of the state code the sponsors recite a long list of benefits to both the public and the industry. Among these are listed the reduction of fires in rural areas, insurance rates as a consequence in time, the reduction of building costs because of greater standardization of ordinances and requirements, the insurance to the customer that he will be getting the safe job he pays for, elimination of dumping of inferior and dangerous devices and fittings of foreign or unscrupulous make, simplicity of enforcement and free inspection to the farmer or small home owner who may make the installation himself.

The eight major cities in the state having ordinances in operation will not be affected by the code, which is designed to provide inspection for smaller towns and rural areas. A single state inspector will be empowered to deputize local inspectors.. A self supporting board of appeals is provided, and a bond required of contractors as a guarantee to the public safe workmanship.

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Inspectors Discuss Gas Range Lights

NEW problems presented by gas ranges equipped with electric clocks and electric lights, and grounding difficulties in dry areas of southern California where county inspection prevails and no city water system is available, were among the two interesting discussion features of the last meeting of the Southern California Chapter, International Association of Electrical Inspectors at Los Angeles City Hall, Jan. 23. Chairman J. H. Crannell presided.

Arthur Veit, Los Angeles County electrical inspector, told of his jurisdiction over a territory of 400 sq. mi., divided into seven districts, with 27 inspectors handling building and electrical inspections. Mr. Veit reported the chief trouble was in finding suitable grounds in outlying districts where no water piping was available and the ground was dry. Discussion was had whether driven grounds or double fusing should be used. Mr. Hodges, of Southern California Edison Co., was asked to bring records of experience by that company in its tests of driven grounds to the next meeting. Claude W. Mitchell, secretary-treasurer of the Southwestern Section, who was present, related the history of grounding and single and double pole fusing in the code regulations. Present grounding requirements, he pointed out, at first were prohibited under double pole fusing, then permitted, next recommended and now finally are required.

O'Neill Barnwell, superintendent of building, Beverly Hills, read correspondence between himself and F. E. Vandaveer, in charge of the Los Angeles testing station of the American Gas Assn., relative to convenience outlets, electric clocks and lamps on gas ranges. He expressed the feeling that gas ranges should be provided with a means for permanent connection to the supply circuit for the electrical fittings now coming on such ranges. He said that Mr. Vandaveer had referred the inquiry to the head office at Cleveland where a committee has the problem under consideration. Although it was pointed out by C. W. Mitchell that the code does not require grounding in the case of small combination gas and electric fixtures, the gas range was felt to be a different problem and the opinion expressed was that some permanent connection to the supply circuit should be provided.

Showing the growing interest of the fire department in the problems of electrical hazards in the household, Lloyd B. Canfield, chief of Fire Department, Beverly Hills, and former president of the Southern California Fire Chiefs Club, spoke of the concern of the latter organization for these hazards. A committee was appointed to meet with a similar committee of the Fire Chiefs Club to work out means of cooperation between inspectors and fire chiefs in elimination of electrical hazards.

An interesting talk was made by L. G. Fenner, superintendent of maintenance and construction, California Institute of Technology, on the buildings, equipment and the progress of the work for the new 200-in. telescope which is being ground at the Institute, to be erected on a site near San Diego, Calif. He described the complete artificial illumination, a combination of mercury vapor and incandescent lamp units, which provide 25 to 30 foot-candles of illumination on the work, and the special electrical machinery designed and built for grinding to accuracies within ½ millionth of an inch.

Fred Vore, chief electrical inspector of Pasadena, invited the Chapter to hold its next meeting, March 20, in Pasadena. Mr. Fenner volunteered to assist Mr. Vore in arranging a meeting place at the Institute and to conduct the group on a trip of the various testing laboratories as well as through the building where the lenses for the telescope are being prepared.

Carl Buratti, president of the Electric Club of Los Angeles, spoke on the inspectors' problem of selling themselves to the public. R. H. Manahan, chief of the electrical department, Los Angeles, led the discussion of code lesson No. 9. Numerous construction problems were freely discussed throughout the meeting and suggestions made for the program at the annual convention of the Southwestern Section in San Diego, Sept. 10-12.

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Salt Lake Passes New Electrical Ordinance

Amendments to Salt Lake City's electrical inspection ordinance have been formally approved by the Salt Lake City commission. These amendments create a board of registration, under the division of electrical inspection in the department of parks and public property, which consists of Fire Chief Walter S. Knight and Blaine Grey, chief electrical inspector. Appeals from the decisions of the board may be made to the city commission.

Although home owners are permitted to do electrical work at their own homes without charge other than the ordinary inspection charges, a $25 annual license is required of electrical contractors and a $5 annual license is required of electrical maintenance men in apartment and office buildings. Minor repairs to existing wiring or fixtures may be made by individuals without cost by the board.

Amendments to the ordinance were approved by 50 electrical contractors, public utility engineers, the Electrical League of Utah, building owners and realtors, fire insurance underwriters, the city's legal department and Mr. Grey.

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... in Contemporary Reading

THE HANDBOOK OF CHEMISTRY AND PHYSICS —*Nineteenth Edition*, published by Chemical Rubber Publishing Co., Cleveland, Ohio, price $6. Exhaustive in every respect, are the contents of this newest edition of 1,934 pages of tables, formulae and data for the use of the engineer, physicist, chemist, mathematician, or student. Of interest to those in the electrical industry are its 114 pages on sound, electricity and magnetism, 70 pages on light and a number of its 146 pages on heat. It would be hard to conceive of any information of a basic reference character that could not be found in this handbook. In its newest edition it has been enlarged and has brought up to date a number of tables. Likewise it has added more than nineteen new kinds of tables to the already large content.

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CRC—A Customer Relations Code for the Gas Industry—*Western Gas* magazine, pp. 10 and 11, Feb., 1935. An excellent summary of public relations points for any utility, gas or electric. Well worth adopting practically as it stands.

...in Lighting

Pasadena Starts Better Light Drive

The Pasadena Chamber of Commerce has joined the national campaign to promote "better light and better sight" in the interest of eyesight conservation. Frank M. Brooks, president of the chamber, has announced a committee to conduct the Pasadena drive as follows: F. B. Nightingale, chairman, Dr. Russell E. Simpson, R. W. Sorensen, B. F. Delanty, Arthur Heimann, C. A. Rowley, W. B. Wilkinson, Dr. W. T. Delphey, Capt. Lynn Harrison, Bailey W. Howley, Courtenay Monsen, Dr. J. H. McKellar, Dr. Henry J. Kaa, E. C. Frazier, W. B. McNulty, Henry F. Bliss, H. L. Gianetti, Mrs. Harold H. Hahn, Kathleen D. Loly, Gladys Smith and Paul Schwenzfeier.

Included in the plans for the Pasadent campaign are: The organization of a Pasadena Better Light-Better Sight Bureau including representatives of all interested professional and commercial groups; the preparation of extensive lecture material, radio program material and the like; the design of display material, newspaper mats and explanatory literature and lectures by trained speakers.

As the result of the campaign it is believed that electric manufacturers will sell more lamps for schools, homes and factories; utilities will sell more power; paint people will profit by the agitation for more and better light reflecting surfaces and the optical group in its turn will benefit by demands for more eye examinations.

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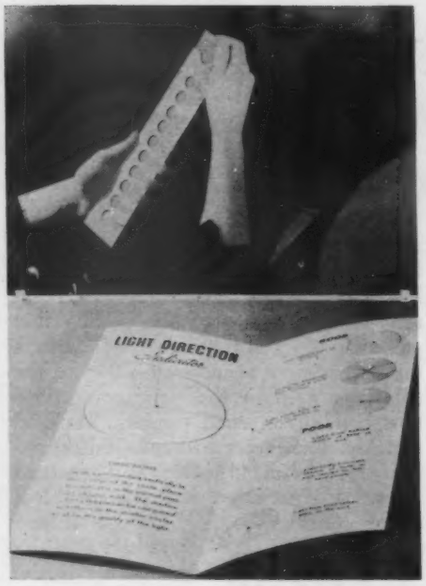
• LEADERSHIP of a Better Sight Bureau was assumed by the Electrical League of Spokane, Wash., for a program of lighting education in that vicinity. Dr. J. Wolff, prominent optometrist, Spokane, and president of the Eastern Washington Optometrists Assn., is giving the cooperation of his organization to the movement. Child sight conservation will be the first objective of the group and a series of talks are scheduled to all parent-teacher organizations. A survey of lighting in all the schools is being undertaken and advertising in newspapers and over radio is helping to acquaint the public with the necessity for good lighting. Dealers who are aware of the opportunities are taking advantage of this promotional work for the selling of I.E.S. lamps, and contractors for the installation of better lighting equipment and wiring.



Simplified Light Tests

Above:—Sitting in your favorite reading chair, you may estimate the adequacy of lighting quickly and easily with the new Westinghouse Light-O-Graph. Remove the slide to expose one opening. If the sensitive film turns the same color as the darker buff of the perforated envelope in 2½ minutes, your light is adequate. Otherwise, the light is inadequate and the lamp is probably too small

Below:—Operating on the principle of a sun dial, the new Westinghouse Light Analyzer permits one to determine proper direction of light for reading, study, or work. A pin, stuck in the center of the disc, casts a shadow to show the direction of light while the reference charts on the opposite page classify it as good or bad

●

Portland School Tests Show Lighting Needed

Lighting tests in the schools of Portland, Ore., in a survey of fifteen typical school buildings, made by lighting engineers of Northwestern Electric Co. and Portland General Electric Co. revealed that most of the schools need better lighting. A report has been compiled and filed with the school board with recommendations for improved equipment.

Interestingly, it was found that the recently built schools were more nearly adequately lighted. Only about 10 per cent of all those surveyed have lighting which can be described as adequate, however.

Twelve checks were made in each room during the day, with and without artificial light, in the schools tested.

M. S. Glenn and S. A. Waldron, illuminating engineers for Northwestern, and Theron W. Fitch and L. D. Johnson, for Pepco, conducted the tests.

...in Merchandising

Electrical Features of San Diego Fair Told

ELECTRICITY will play a vital and important part in the decorative effects as well as the commercial displays at the California Pacific International Exposition which opens in San Diego May 29. The electrical palace will occupy one of the already built buildings and tentative contracts for space in this Palace of Electricity have been made by General Electric Co., Westinghouse Electric & Manufacturing Co., Radio Corp. of America, Electrical Transcription Co., Norge Corp., Postal Telegraph Co., American Telephone & Telegraph Co., Western Union Telegraph Co. and others.

The Bell Telephone Laboratories' exhibit will feature an unusual technical development whereby a speaker into a microphone or telephone instrument will be able to hear just what he has said repeated to him 5 sec. later than the word is spoken itself. This is done through a delayed transmission system and will give those who try it an opportunity to hear just exactly how they sound over the telephone.

Spectacular will be the large Ford building with its high clock tower and spectacular lighting.

●

Furniture Magazine Changes Ownership

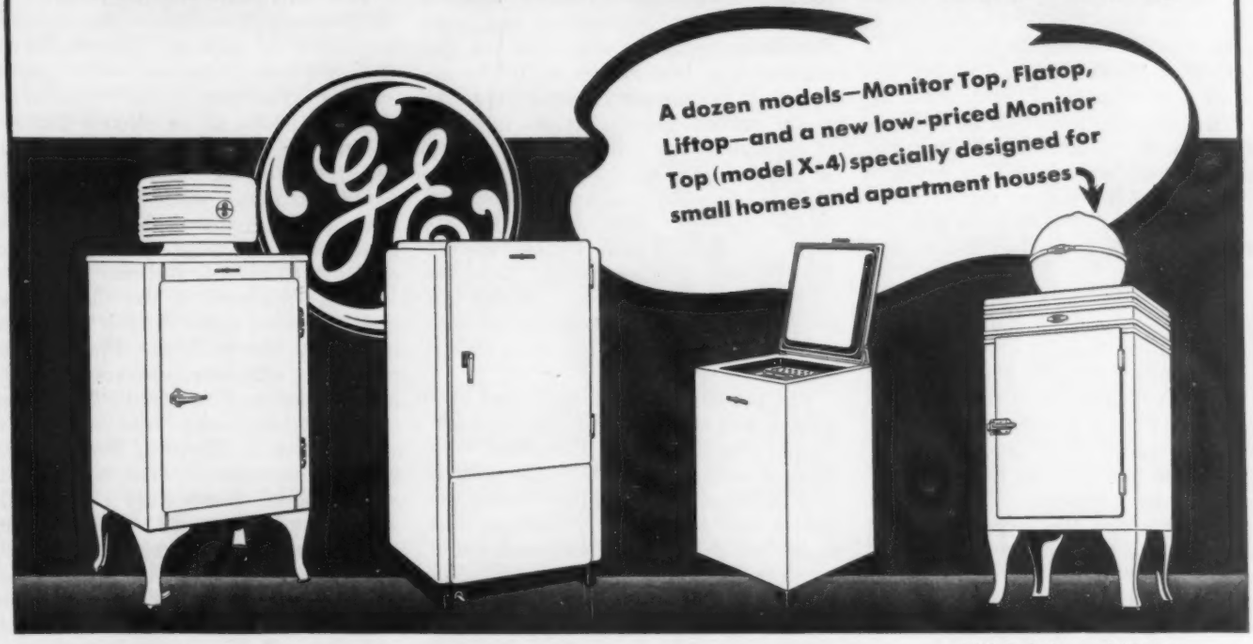
Western Furniture Retailing, a magazine devoted to furniture and home appliances, has been acquired by Phil Battelle, managing director of the Retail Furniture Assn. of Southern California. The magazine was originally started in 1931 by Norris James and Ted Baer and published from the Western Furniture Exchange in San Francisco. With the acquisition by Mr. Battelle, the publication office headquarters will move to Los Angeles.

Jean Scott Frickelton, who had edited the magazine during the past two or three months, will remain on the staff as editor of the appliance section. The magazine will be reduced to the standard magazine size and printed on coated stock. It is to have more pages and a larger news content, with an extensive improvement program scheduled for the publication.

●

• KELVINATOR district managers in the West who received new automobiles as prizes for the sales records made during the past year were: F. T. O'Brien, Seattle, wholesale salesman; L. S. Black, Phoenix, Ariz.; J. A. Black, Helena, Mont.

NOW! THE MOST FAMOUS REFRIGERATOR MECHANISM IN THE WORLD IN ALL 1935 G-E MODELS*


A dozen models—Monitor Top, Flatop, Liftop—and a new low-priced Monitor Top (model X-4) specially designed for small homes and apartment houses

THE famous G-E Monitor Top hermetically sealed-in-steel mechanism—that has made refrigeration history with an unequalled record for dependable performance at low cost—is now available in all 3 types of 1935 General Electric refrigerators—Monitor Top, Flatop and Liftop. This is the mechanism that won for the General Electric Monitor Top the greatest public preference ever enjoyed by any electric refrigerator.

5 YEARS PERFORMANCE PROTECTION

• In addition to the standard 1 year warranty, 1935 G-E refrigerators carry 4 more years protection on the matchless sealed-in-steel mechanism for $5 . . . *five full years for only $1 a year!*

PERFORMANCE COUNTS!

After all, it's the *performance* of any refrigerator that determines its real money-making value to the retailer and its real worth to the customer. If it continues to give satisfactory, economical service year after year, the dealer has no expensive, profit-eating service problem. The customer, with a refrigerator that exceeds even the greatest expectations of dependable performance, enthusiastically recommends it to friends and neighbors, and new sales result.

The General Electric dealer has the added advantage of selling other G-E Kitchen appliances and G-E Laundry appliances to his *satisfied* refrigerator customers. • Write or wire for complete details of the General Electric franchise to the G-E refrigerator distributor below, whose address is nearest you.

THE GEO. BELSEY CO. LTD. Los Angeles
ELECTRIC APPLIANCES, INC. San Francisco
VALLEY ELECTRICAL SUPPLY CO. Fresno
GEO. T. BAUDER CO. San Diego
GENERAL ELECTRIC SUPPLY CORP. Portland • Butte • Salt Lake City • Seattle
B. K. SWEENEY, INC. Denver

GENERAL ELECTRIC

* *All single door and Liftop types*

THE REFRIGERATOR THAT DEFIES TIME!

Monitor Tops in use in homes for **6** and **7** years have been cut apart at the General Electric Research Laboratories and found to be in such first class condition that it is impossible to place a limit on the years of service to be expected from this matchless sealed-in-steel mechanism.

Northwest Commercial Meeting Promises Aggressive Load Building

BUILDING load by merchandising on low terms over a long time period was the principal point of discussion at the 10th Annual Conference of the Business Development Section of the North-West Electric Light & Power Association at Vancouver, B.C., Feb. 21-22. The program, with Tom D. Fulford, Puget Sound Power & Light Company, chairman, emphasized 1934 experiences of member companies in various lines of business building enterprise and thus was packed with useful fact and a minimum of theory.

The subject of low term, long period merchandise was introduced by W. T. Christy, Edison General Electric Appliance Company, Atlanta, Ga., who told of the 1934 load building results of the Tennessee Power Company, Alabama Power Company and Georgia Power Company in line with the E.H.F.A. program in the Tennessee Valley. Mr. Christy attributed the success of these companies in substantially increasing average domestic use during 1934 to executive interest in the load building programs and to the long term offers on the purchase of appliances. A complete copy of Mr. Christy's paper will appear in a later issue.

This low-term long-period method of increasing saturation of heavy load building devices will dominate the 1935 program of the Puget Sound Power & Light Company, as explained by F. E. Ross of that company. The story of this program is completely told elsewhere in this issue.

In the consideration of promoting water heating load three methods being successfully used in the Northwest territory were discussed. One company was selling equipment at cost; another company was maintaining list price on the equipment but stressing the service features of automatically supplied hot water; the third company was merchandising the automatic water heater as a device. R. B. McElroy, The Washington Power Company, and Orr E. Crites, Portland General Electric Company, each explained the methods used by their respective companies in promoting greater acceptance of this load.

In discussing methods for promoting refrigerator load, L. W. Brainard, Idaho Power Company, stated his own merchandising program was based on the premise that best results would be secured if the company remained active in the market, regulating the intensity of its activity according to the activity of and results secured by other dealers. He told of the formation in his territory of the Electrical Equipment Sales Association divided into logical market districts with a chairman in each district, and further divided into five bureaus each concerned with the promotion of one general class of home equipment.

The subject of small appliance promotion was covered by J. A. Lockhart, Pacific Power & Light Company, who brought out the fact that this promotion had been effective in increasing the use of energy by the minimum customer, and that a continuous sales activity on lamp socket appliances was being carried on by his sales organization even though the organization was set up to feature the heavy load building devices.

J. B. Buman, Northwestern Electric Company, told of his company's organization of a Home Lighting Department, pointing out the good points and weaknesses that had developed in the program during a year's trial.

Ways in which the optometric profession and the lighting salesmen could be mutually helpful were brought out by Dr. Leslie R. Burdette, Secretary, Oregon Optometric Association, Salem, Ore. He urged a close tie-up between lighting departments of utility companies and the optometrists of the Graduate Clinic Foundation, a national organization in his profession having local groups throughout the territory of the Association.

How the home lighting service girls could make substantial increases in wattage in the course of their home surveys was vividly portrayed in a skit directed by Walter E. Potter, Incandescent Lamp Department, General Electric Company, and acted by Harriet Klumpp, Northwestern Electric Company, and Corliss Guy, Puget Sound Power & Light Company.

The possibilities in talking motion picture advertising were demonstrated by a showing of trailers by James Lightbody, B. C. Electric Railway Company, who pointed out the pitfalls to be avoided and explained how in the experience of his own company these trailers had been improved as time went on.

Two skits enlivened the program of the Domestic Sales Bureau, chairmanned by Glenn L. Jackson, The California Oregon Power Company; one a playlet, entitled "The Big Night", portraying the sales points of an electric kitchen; and the other, "A Day With the Weeks Family", bringing out sales features of an automatic hot water system. These were both produced by actors and actresses drawn from the organization of the B. C. Electric Railway Company.

In the program of the Commercial and Industrial Sales Bureau conducted by O. C. Mayer, Idaho Power Company, vice chairman, unfavorable competitive factors met with in developing commercial cooking load were discussed by A. K. Gaylord, Northwestern Electric Company. Mr. Gaylord showed a new model, heavy duty range built somewhat lighter and cheaper than equipment now on the market, and built on the unit plan for flexibility in designing different installations to meet the varying needs of customers. The wiring for this range and its component units was greatly simplified from present wiring.

The possibilities for increasing the commercial lighting load in the store modernization now taking place under the Federal Housing Act were graphically portrayed in a series of slides shown by L. B. Gawan, Utah Power & Light Company. Many ways of utilizing light for decorative and utilitarian purposes in store fronts, windows and interiors were illustrated by practical applications installed during the past year in the territory of his company.

In the industrial power field Thomas M. Gibbes, Puget Sound Power & Light Company, Chairman, introduced the subject of how to obtain small and large industrial heating loads, touching on the types of rates needed to obtain these loads, and the electric melting of brass and iron, and a discussion of competition with the small high-speed Diesel engine.

H. C. Bender, The Washington Power

Company, Chairman, Air Conditioning Committee, told of accomplishments in this field during the past year, and Thomas J. Mellon, North Wesix Electric Company, Seattle, brought out the possibility of securing profitable electric heating business, stressing the auxiliary heating field, in connection with the promotion of air conditioning. In this connection there was a discussion of the house heating experiment now being carried on in Mason City, the contractors' camp for the construction of Grand Coulee dam.

Under the title "Does Rural Electrification Pay?" J. C. Scott, Puget Sound Power & Light Company, brought out the economic value to the state of the intensive rural electrification program carried on over the past several years by his company. As an example this electrification has changed the state of Washington from an egg-importing state to a large exporter, bringing millions of new revenue to the Washington farmers, and other similar examples were cited.

R. S. Overstreet, Idaho Power Company, discussed his company's farm electrification program by which 60 per cent of the farms in the territory served by the company are now electrified.

A feature of this Bureau program, chairmanned by C. J. Hurd, Mountain States Power Company, was the showing of a film "Jim Stays on the Farm", produced in the territory of The California Oregon Power Company and Mountain States Power Company by H. D. Kem of those companies, in which a romantic story was used as the background for the showing of 20-odd accepted farm applications of electricity. The film has been in considerable demand for grange and other farm meetings, and has been well received. The picture was taken with an ordinary amateur movie camera on 16 mm film and the ghost voice and musical program were later imprinted on the film in sound track.

W. G. Murrin, President, British Columbia Electric Railway Company, welcomed the delegates to Vancouver on the opening morning, and in his response thereto Leslie R. Coffin, Puget Sound Power & Light Company, and President of the Association, sounded the keynote of the meeting when he stated that the commercial men would have to sell the industry out of the depression. Arrangements for the meeting, which was held in the auditorium of the B. C. Electric Railway Company, were handled by W. C. Mainwaring, merchandise manager for that company, assisted by Edmund E. Walker, sales engineer, and a staff of other employees.

P.C.E.A. Meets in Fresno April 11-12, 1935

Arrangements have been completed for a Spring Conclave of the Pacific Coast Electrical Association to be held in Fresno, April 11-12. At this time prize winning papers of the P.C.E.A. contest, announced in the December issue of Electrical West, will be presented. In this connection the date for submitting papers has been extended from March 1 to March 15.

Both commercial and engineering problems will be discussed during the two-day meeting. Sessions will be held in the San Joaquin Light and Power Company's Building. Final details will be announced in the April issue of Electrical West.

•

Measures Affecting Utilities Introduced

Included among measures affecting public utilities introduced into the California State Legislature is a proposed bill authorizing the creation of public utility departments by cities, counties or districts with the power to issue revenue bonds for self-liquidating projects without a vote of the people. Under the terms of the bill these departments would be set up by resolution or ordinance. Commissioners who would have no taxing power would be placed in charge and would be given the right to issue revenue bonds for any public utility purpose. Revenue bond issues would be limited to 40 years with a maximum interest rate of 6 per cent.

Commissioners would not be elected but would be appointed by the chief executive officer of the city, county or district or by the president of their respective legislative bodies. Confirmation by the law making body would be required of such appointments.

Another measure would permit cities and counties to use portions of their state gasoline tax allotments for street lighting improvements and maintenance. This measure is designed to relieve municipalities from the direct cost of street lighting.

A third piece of legislation is a resolution calling for an emergency appropriation of $50,000 to complete the presentation of the $170,000,000 Central Valleys water project to the federal authorities in Washington. Certain additional surveys are necessary in connection with the project and would be covered by the appropriation.

Another resolution seeks a $5,000 appropriation for an investigation into the feasibility of the state government assuming the ownership and management of all privately owned California power and water public utility corporations. The resolution calls for the appointment of a committee of seven to report to the Legislature in 1937.

Major problem confronting the California Legislature is the passage of tax legislation to meet an estimated $100,000,000 deficit for the next biennium. A portion of this deficit was created as a result of the Riley-Stewart tax program passed by the people at the last election whereby public utility properties are returned to local tax rolls and are exempted from gross revenue taxes levied by the state.

•

A.I.E.E. Convention Changed to Seattle

Announcement from national headquarters of the American Institute of Electrical Engineers indicates that the Pacific Coast convention of that body will be held this year in Seattle instead of Los Angeles, as previously planned. Definite dates and complete program will be announced shortly.

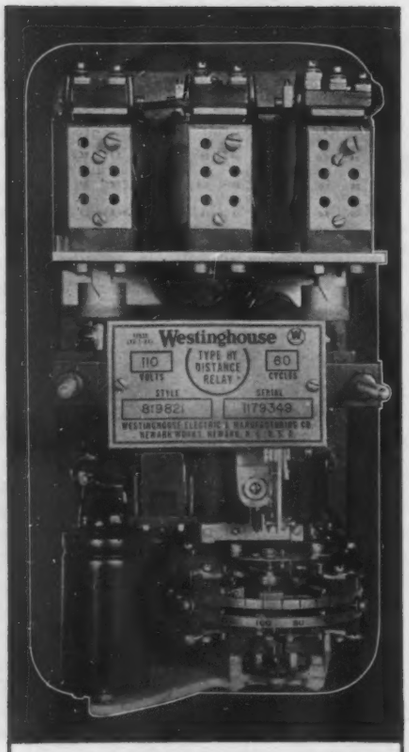
Los Angeles will be host to the electrical engineers in 1936, when, for the first time in the history of the Institute, the annual summer convention will be held on the Pacific Coast under the sponsorship of the Los Angeles Section of the A.I.E.E. In 1936 the Pacific Coast convention is scheduled to be merged with the summer convention which will be held some time in June.

•

Roosevelt Disapproves of Columbia Valley Authority

Word was recently brought back from Washington to the Pacific Northwest by Marshall N. Dana, chairman, Pacific Northwest Regional Planning Commission, and district chairman of the National Resources Board, that President Roosevelt does not favor at this time the creation of a Columbia Valley Authority. He prefers the continuance of the fact finding and plan making such as that now in progress by the regional planning commission. This commission has already undertaken the preparation of a 10-year plan for general development in the Northwest states keyed to the federal power projects at Bonneville and Grand Coulee. Mr. Dana stated the president was fully informed on and displayed a lively interest in the further development of the Columbia Basin.

Under these circumstances it is not likely, according to Mr. Dana, that Senator Pope of Idaho will press his CVA bill at this session of Congress, nor that Representative Knute Hill of Washington will urge his bill designating the Reclamation Bureau as the Columbia Valley Authority.



HY HIGH-SPEED RELAYS

★For the rapid clearing of faults on the shorter line sections where the arc resistance of short circuits may reach a value comparable to the line impedance.

The HY relay possesses all of the many unequalled advantages of the HZ. The essential features of this relay are:

1 A pure impedance element which protects 80% of the line and which will operate within a minimum time of less than one cycle.

2 A timed distance element with modified impedance characteristics to protect the remaining portion of the line.

3 A timed back-up impedance element.

Complete information about the HY will be sent promptly upon request.

Westinghouse

Room 2-N East Pittsburgh, Pa.
R57005

SINCE 1888
METERS INSTRUMENTS RELAYS

Riparian Rights Upset By Supreme Court

Disregarding the 80-year old rule, the California State Supreme Court laid down a new water doctrine established on the principle of reasonable use. Under the old riparian rights doctrine, it was held to be the right of the owner to have all the water of a stream, flood and otherwise, which flow to, through, and over his land without regard to their use and without regard to the method or manner of such use. Waters unused were wasted.

The new doctrine permits flood waters and waters heretofore wasted to be appropriated and put to beneficial use without prohibitive price heretofore demanded by riparian owners. The decision is of vital interest to the utilities of the state which have spent billions of dollars in buying riparian rights and which in the future will be freed from the necessity of meeting exorbitant demands by land owners who do not and cannot utilize the waters thereof.

•

Seattle to Enjoy Low Merchandising Terms

Frank McLaughlin, president of the Puget Sound Power & Light Co., and J. D. Ross, superintendent of Seattle City Light, announced extraordinary merchandising offers which, it is believed, will benefit thousands of homes in Seattle and in Western and Eastern Washington.

The Puget Sound Light & Power Company offered ranges and waterheaters in the territory served by the utility at unheard of down payments and monthly rates as did the City of Seattle Lighting department. For instance: The Puget Sound is offering Hot Point electric ranges for $1.95 down payment and $1.95 a month and automatic water heaters with Monel metal tanks for $2.35 down and $2.35 per month. The water heater is manufactured by the Edison General Electric Appliance Co.

The City of Seattle Light Department is offering L. & H., Hotpoint or Westinghouse ranges at $1.75 down and $1.75 per month and water heaters for $2 down and $2 per month. The City of Seattle also announced the cost of wiring homes for electric ranges and heaters has also been reduced, savings estimated to be as high as 50 per cent.

•

Utilities Big Contributors to Property Taxes

From analysis conducted by questionnaire by Berkeley Snow, executive secretary of the Northwest Electric Light & Power Assn., it was revealed that public utility companies in the state of Oregon in 1934 paid 17.67 per cent of all the property taxes levied in the state. Electric utilities paid 6.37 per cent, the railway group 7.6 per cent while the balance is made up of telephone, telegraph, water, and gas companies. During 1934 the property taxes of the electric companies amounted to $2,649,074, the total being paid by 31 separate companies. Figures and greater detail are contained in a report of the N.E.L.&P. Assn., copies of which may be had by addressing Berkeley Snow, 707 Spalding Building, Portland, Ore.

COLT-NOARK

SWITCHES - MOTOR STARTERS - FUSES

The NEW
Type "A" 575 Volt NOARK
Industrial Safety Switches

New in design from top to bottom, the improved Noark Type "A" switches are built for closer banking, longer life, greater efficiency. New type unit block construction—new handle and cover catch. Write for complete details.

QUADBREAK AND DUALBREAK TYPE A SAFETY SWITCHES
DUALBREAK AND NUBLADE TYPE C SAFETY SWITCHES
TYPE D SWITCHES
MOTOR STARTERS
METER SERVICE SWITCHES
COMBINATION RANGE AND ENTRANCE SWITCHES
RENEWABLE, INDICATING AND NON-INDICATING FUSES
FUSE ACCESSORIES
CAST IRON BOXES AND FITTINGS
LINE MATERIAL

PACIFIC COAST REPRESENTATIVE
H. B. SQUIRES COMPANY
San Francisco — Los Angeles — Seattle

COLT'S PATENT FIRE ARMS MFG., CO.
Electrical Division :: Hartford, Conn.

Commission Orders Cut in San Diego Rates

An order filed Feb. 5 by the Railroad Commission reduces the rates of the San Diego Consolidated Gas & Electric Co. approximately $285,000 a year. With the exception of a small reduction in manufactured gas rates in Escondido, the reduction is confined to electric rates mostly in the domestic and commercial schedules within incorporated cities of which San Diego is the principal one in the territory. In arriving at the decision various corporate entities were disregarded and an exhaustive investigation was made into the holding and management company fees and charges of the Standard Gas & Electric Co., of which the San Diego company is a subsidiary and operated by the Byllesby Engineering & Management Corp. The decision eliminates $1,360,000 from the property base and cuts the yearly management fee of 2½ per cent of the gross revenue amounting to about $175,000 per year to $70,000 per year.

An undepreciated rate or property base of $36,000,000 for 1935 was held reasonable. Accrued depreciation was found to be $7,250,000. No additive amount for going value was allowed in the order. The decision allows a rate of return of approximately 6⅔ per cent which was recently allowed the Pacific Gas and Electric Co. but which is under attack in the federal courts as unreasonable.

Major reductions are $136,000 in domestic electric service and $132,000 in commercial electric service. New rates will be effective on meter readings on and after March 1, 1935.

•

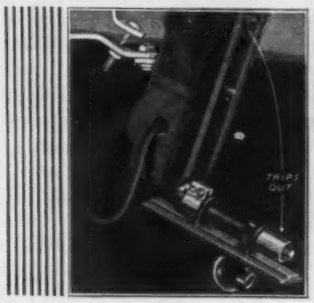
Utility District Proposed in Oregon

Preliminary petition for the establishment of a "People's Utility District" near Astoria, Ore., was received in the office of the state hydroelectric board late in January. If it is approved by that body, the district may proceed to the preparation of a final petition, setting the proposal out in more detail, preparatory to offering it to a vote of the people of the district.

The territory embraced is a narrow strip of farm land about 20 miles long, running east along the Columbia River from Astoria, containing three small communities, Svenson, Knappa and Brownsmead. The territory is now served by the Knappa-Svenson Electric Co., which buys power wholesale from Pacific Power & Light Co. serving Astoria. The proposal as outlined contemplates buying out the Knappa-Svenson company and continuing to purchase from the Pacific company. Better service, is the aim of the petitioners.

WHERE TO BUY . . . IN THE WEST

KEARNEY
TRIPOMATIC
PORCELAIN HOUSED CUTOUT



Outage indicating — air gap separation of contacts—cartridge and door are a single unit—swivel hanger —point pressure contacts.
Further Information Gladly Furnished

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

LAPP
Line Post Insulators

Lapp Line Post Insulators eliminate radio interference due to both dirt and electro-static conditions.
Write for Bulletin No. 112 describing and cataloguing these insulators.

LAPP INSULATOR CO., Inc.
Le Roy, N. Y.

PROVIDENCE INSULATED WIRE CO.
Manufacturers of
Type AEIC
Service Entrance Cable

Concentrically wound bare neutral conductor, galvanized oval armor, weatherproof and flameproof finish.

For use on entrances without conduit.

Proof Against Theft of Current

Samples and prices on request.

PROVIDENCE INSULATED WIRE CO.
PROVIDENCE, R. I.

McLAUGHLIN

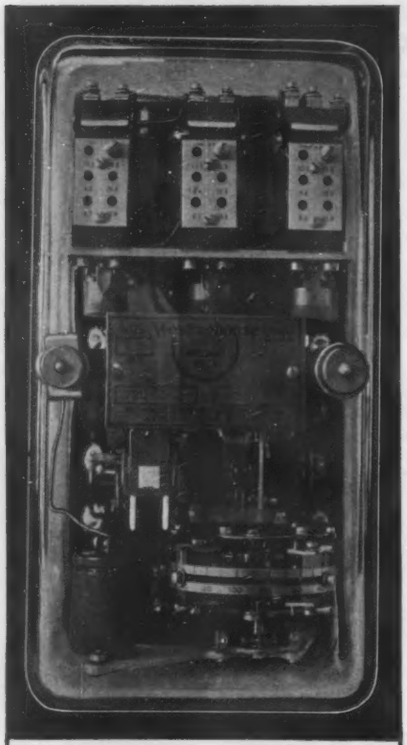
For Telephone and Telegraph Lines.
GLASS INSULATORS

LOCUST PINS

. . . . . Oak Brackets *and* Pole Steps
Safety—Strength and Lasting Economy

LOCUST PIN CO., - - Front Royal, Va.

MAYDWELL & HARTZELL
INCORPORATED
FACTORY DISTRIBUTORS
LOS ANGELES SAN FRANCISCO



HZ HIGH-SPEED RELAYS

★ For rapid clearing of phase-to-phase, 3-phase or 2-phase to ground faults.

Among the many advantages of this all impedance, 3-step relay are:

1 High-speed operation. Relay operates in one cycle or less.

2 Extremely accurate operation.

3 Synchronous timing device for 2nd and 3rd elements. Distance element on the synchronous timer gives approximate location of fault.

4 Back-up protection assured by the 3rd element.

5 High-speed induction dynamometer directional element which operates over a wide range in voltage and current.

For complete information ask for C.S. 41-415, Type HZ High-Speed Relays.

Westinghouse

Room 2-N East Pittsburgh, Pa.

R57006

SINCE 1888

METERS INSTRUMENTS RELAYS

Contracts Let For More Boulder Plant Equipment

Contracts approximating $1,000,000 for electrical equipment for the Boulder Dam power house were let by the Bureau of Reclamation last month. Westinghouse Electric & Manufacturing Co. will furnish four 287.5-kv. oil circuit breakers with neutral ground reactors and cubicles at a price of $421,452 and $21,070 respectively. Four 287.5-kv. outdoor lightning arrestors went to General Electric Co. at a price of $37,120. Bowie Switch Co. received a contract for twelve motor-operated 287.5-kv., 1,200 amp., 3-pole disconnecting switches at a price of $106,000.

Delta Star Electric Co. was awarded a contract for one 23,000-volt, 4,000-amp. bus structure with current transformers for $108,430. Four 600-amp., 15,000-volt oil circuit breakers were awarded to I-T-E Circuit Breaker Co. at a price of $264,603.

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• NEW CONSTRUCTION WORK, estimated to cost $769,810 on the system of the Los Angeles Bureau of Power and Light in preparation for receiving Boulder Dam Power has been authorized according to an announcement by E. F. Scattergood, general manager. Of this sum, $395,810 will be expended upon system extensions, betterments and replacements. Of the remainder, $241,000 will be used for the construction of a receiving station at Eagle Rock and $133,000 on a similar station in the Pacific Palisades district.

•

• CONTRACT FOR the construction of the City Light building, on Third avenue and Madison street, for the City of Seattle Lighting Department, has been awarded to the Sound Construction & Engineering Co., Northern Life Tower, Seattle. This structure will be two stories, of steel and concrete construction, costing $301,000.

•

• WESTINGHOUSE ELECTRIC & MFG. CO. was awarded the contract for two Norris Dam generators by the Tennessee Valley Authority. Units will be of the umbrella type, rated at 56,000 kva., 112½-r.p.m., and will weigh 1,320 tons each.

•

• PURCHASE OF $43,636 worth of electrical equipment to be used in connection with tunnel driving operations on the Colorado River Aqueduct has been approved by the board of directors of the Metropolitan Water District of Southern California. The equipment purchased included 25,000 feet of armored power cable from the Westinghouse Electric Supply Company for $29,875, and nine transformers from the General Electric Company for $13,761.

CHROMALOX

Replacement Range Units

ARE SAVING CUSTOMERS for many central stations, by demonstrating the actual advantages of MODERN electric cookery. These units are speedy, clean, safe and long-lived. They bring old ranges right up to date. Adaptor rings (detachable) enable you to fit any make. Many power companies offer a free trial, and cash in on increased load and pleased customers. Write for our sales campaign and details.

EDWIN L. WIEGAND CO.
PITTSBURGH, PA.

Represented by

MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
524 S. W. Pine St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
912 E. 3rd St., Los Angeles, Calif.

THE PETERSON COMPANY
1921 Blake St., Denver, Colo.

Think of our facilities as *your* instrument department

It often happens that the Bristol's Recorders you installed years ago are required today to measure temperatures or pressures under changed conditions and within different working ranges. This calls for re-modeling or re-standardizing that our West Coast Service Laboratory and Assembly Plant is in a position to do promptly, correctly and inexpensively.

Bristol's West Coast Service Laboratory and Assembly Plant

THE BRISTOL COMPANY

Branch Offices: Rialto Bldg., San Francisco
747 Warehouse St., Los Angeles
Branch Factory: 311 Minna St., San Francisco

TRADE MARK

BRISTOL'S

REG. U. S. PAT. OFF.

Washington Working For High Dam at Grand Coulee

Assurances that the power amendment will pass both House and Senate have been sent Senators Lewis B. Schwellenbach and Homer T. Bone by Kenneth G. Harlan, framer of the constitutional amendment to permit the State of Washington to transmit power from Coulee Dam. Harlan made his forecast after conferences with senators and representatives from many parts of the state who pledged their support. It was introduced in the House with 88 members sponsoring it and will receive almost the same favorable proportion in the senate, Harland advised the two senators in Washington, D. C. Harlan declared that the passage of the amendment would virtually assure construction of the high dam at Grand Coulee by satisfying the President that the state will construct transmission lines, if need be, to carry the excess current to its potential markets west of the Cascade Mountains.

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• THE FEDERAL HOUSING ADMINISTRATION is offering to anyone who can use them attractive colored poster stamps carrying the message of better housing. These are available to paste on letterheads, envelopes, packages, etc., as a constant reminder for home modernization, repairing and remodeling.

New Plans For Caspar-Alcova Project

Legal obstacles to the Caspar-Alcova power and irrigation project will be removed, according to the new plan proposed by Dr. Elwood Mead, Commissioner of Reclamation, and approved by H. L. Ickes, Secretary of the Interior. By reducing the irrigation phase to 35,000 instead of 66,000 acres and confirming to priority rights on a 1934 instead of a 1904 basis, elements of controversy with water users in Wyoming will be removed and work can go forward as soon as repayment contracts are signed.

Construction cost allocated to irrigation, totaling $80 per acre and to be repaid by an average annual charge of $2 per acre, throws the main burden of repayment upon income from power sales. As the share chargeable to power under the new plan is $1,000,000 less than the old, this is construed as enhancing the feasibility of the project which is favorably situated due to its proximity to surrounding cities in Wyoming and to large metal deposits. According to the new plan, Casper-Alcova power will be made available to private utilities with the right reserved to terminate contracts and sell to municipalities as soon as they are ready to take it.

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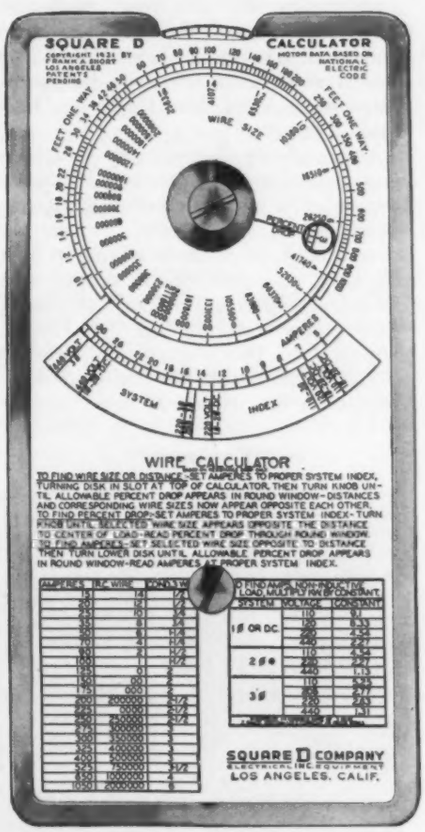
$2.50 BUYS INSTANT ANSWERS To Wire and Motor Problems



SQUARE D CALCULATOR

Illustration shows wiring calculator. Motor calculator on reverse side. The simple and speedy accuracy of this calculator saves time, eliminates errors, does away with mental and written calculations, charts and codes. Ask your dealer or write nearest Square D office.

The new SQUARE D CALCULATOR is an exact duplicate in every technical detail of the one which, when introduced, received instant approval from electrical men, everywhere.

This SQUARE D CALCULATOR figures accurately and instantly the answers to motor and wiring problems. It's substantially made to withstand rough usage in the field; it's compact, handy, pocket size.

Actually, this SQUARE D CALCULATOR contains two separate and distinct calculators. Based on new issue of National Electrical Code, one computes motor data; the other, wiring data. The wiring calculator will figure any one of four items — amperes, feet of wire, size of wire and per cent drop. The motor calculator gives data on the three principal types of 220 volt and 440 volt, 3 phase motors. Set for the proper horsepower, the following data can be read —circuit switch size, starting fuse size, conduit size, wire size, necessary running protection and full load amperes.

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☐ Enclosed is $2.50. Please send me a Square D Calculator, to address given below.

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...about People

Appointed Western Distribution Manager

William P. Swartz, who has been Pacific Coast district representative for The Standard Electric Stove Co. of Toledo, Ohio, for fifteen years, has been appointed manager in charge of western distribution, in charge of stocks which are carried in Los Angeles, San Francisco and Seattle. Increasing volume

WILLIAM S. SWARTZ

on the Pacific Coast has necessitated carrying complete stocks in these focal points.

Mr. Swartz began his electrical career as a salesman for the A. T. Knowlson Co. in Detroit, at that time establishing many dealers for Standard Electric ranges in the Michigan territory. In 1919 he went to the Pacific Coast for Crystal washers. In 1920 he became associated with The Standard Electric Stove Co.

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• WILLIAM L. CONE has been appointed safety director of the Utah Power & Light company, with headquarters at Salt Lake City. He succeeds J. H. Sundstrom.

Mr. Cone for several years was connected with the Telluride Power company, and later joined the Utah Power & Light company. In 1926 he became engineer and local manager of the Mountain States Power company at Forsythe, Montana, after which he became engineer and superintendent of the Dixie Power company at Cedar City, Utah.

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• W. P. WHITSETT, chairman of the Board of Directors of the Metropolitan Water District of Southern California, has been unanimously re-elected for another two-year term of office. He has been chairman of the board since the inception of the Water District in 1928. Other present officials also re-elected were Franklin Thomas of Pasadena, vice-chairman; S. H. Finley of Santa Ana, secretary and D. W. Pontius, controller.

RAY C. CAVELL

Cavell Returned as Electric Club President

Ray C. Cavell, who previously had filled the unexpired term of president of the San Diego Electric Club was elected to that office on his own right at the meeting recently for official elections. He succeeds Roger S. Ruffin, who has been the colorful president of the club during the past year. Both men are connected with the San Diego Consolidated Gas and Electric Co., Mr. Cavell as superintendent of the Record Department, and Mr. Ruffin as Easement Agent.

Other officers elected were, A. S. Glasgow, assistant superintendent of electric transmission and distribution, first vice-president; E. T. Bailey, formerly in charge of Westinghouse affairs in Mexico City, and now retired, second vice-president. Directors of the club elected were: Sam Hall, manager of Electric Supplies & Distributing Co.; Gerald Heilbron, Heilbron Electric Co.; A. E. Johnstone, city electrical inspector; W. A. Saleebey, Parmelee-Dohrmann Co.; and Roger Ruffin. C. M. Allen, also of the power company, is secretary-treasurer.

Mr. Ruffin inaugurated the plan of having a short talk on some feature or problem in the electrical industry at each meeting, in addition to a speaker on a general topic. Under his administration also was arranged the agreement with the Bureau of Radio and Electrical Appliances by which every member of that organization automatically became

ROGER S. RIFFIN

a member of the Electric Club. Mr. Cavell has proved a popular and tireless leader with many original ideas, and a year of unusual activity under him is anticipated.

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• C. O. HAWKINSON, for 15 years identified with the electrical appliance field in Seattle and other localities, has been named manager of the electrical appliance division recently opened by Carew & Shaw, Seattle department store operators. Assisting Mr. Hawkinson will be F. C. Hooper, manager, radio division; W. C. Scott, manager, washing machine department and Fred Mill and Harold Peck, in charge of electric refrigerator sales.

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• M. L. WILKINS has ben appointed manager of the Oakland, Calif., branch of the Graybar Electric Co. Mr. Wilkins joined the Western Electric Co. in 1923, coming from the Kewanee Western Supply Co., of Twin Falls, Idaho. For the past 12 years he has been engaged in sales work in the Oakland office of the Western Electric and Graybar Companies and his promotion is a natural outcome of this activity.

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• R. C. BRAGG, Alco Electric Co., Vallejo, Calif., won the 1934 Quota Busters' Club distinction of "rancher" for greatest percentage of quota sales of Westinghouse refrigerators. This also makes him a director of the club for 1935. Claxton White, of Pittsburg, Calif., was also a high quota man and won the title of "ranch superintendent" in the national sales campaign.

"Toppers"

These General Electric merchandising salesmen won a free trip to Miami, Florida, with all expenses paid for their 1934 accomplishments in the sale of G.E. home appliances. Standing, from left to right, are: H. B. Rector, San Francisco retail manager; J. F. Mahoney, San Francisco retail salesman; H. L. Stradley, dealer specialist. Seated, left to right, are: Homer Grider, Oakland dealer; Don McBride, Sacramento retail salesman; H. C. Falkell, commercial salesman, and E. W. Tharratt, San Jose dealer salesman; all of Electric Appliances, Inc., San Francisco

Death Takes Utah Utility Executive

Ralph M. Bleak, superintendent of lighting and appliance sales of the Utah Power & Light company, died at a hospital in Salt Lake City on Feb. 5, of pneumonia, after a brief illness.

Mr. Bleak was born in Manti, Utah, in 1891, and educated in the schools of Salt Lake City and the University of Utah. His career in the electrical industry began in 1915, when he entered the employ of the general sales department

RALPH M. BLEAK

of the Utah Power & Light company. He was later given the position of chief clerk in the sales department of that company's Salt Lake division, and was subsequently promoted to the position of sales superintendent of that division. In 1919 he was again promoted to the position which he held at the time of his death.

Active in civic affairs, he also was an outstanding figure in his company's commercial activities and prominently identified with the work of the Northwest Electric Light and Power Association, and other regional and national affairs of the electrical industry.

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• THOMAS B. PARKS, purchasing agent for the Los Angeles Gas and Electric Corporation during the past 22 years and secretary-treasurer of the Los Angeles Electric Club, died Feb. 1. He had been ill for several months but just before his death had appeared to be making encouraging progress toward recovery. Mr. Parks was born in Sheffield, England on June 2, 1882. He had been a member of the Los Angeles Gas and Electric Corporation organization since 1902.

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• JOHN I. NEWELL, vice-president of the B. C. Electric Railway Company, Ltd., died in Vancouver, B. C., Feb. 5 after a three-day illness. Mr. Newell was one of the most popular and well-known utility executives in the Northwest and was prominently identified with the growth of the B.C. utility during the 28 years he was identified with the company.

Busy Fresnan

Busy in the new branch office of Graybar Electric Co., Fresno, is Henry Siesbuttel, manager of the office. Christmas business was extraordinarily good in the territory of "free electricity" and of the "one-half off" offer

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• WALTER J. DAILY, who for eight years has been in charge of advertising and sales promotion for General Electric Co.'s specialty appliance sales department, has resigned to head a new advertising agency to be known as Walter Daily, Inc., with headquarters in Cleveland.

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• H. J. GILLE, manager of the industrial and agricultural bureau of the Puget Sound Power & Light Co., with headquarters in Seattle, was named president of the West Coast Mineral Association at the annual meeting of the association held in Seattle on Jan. 15.

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L. E. Brown, manager of the Salt Lake office, and W. R. Marshall, Pacific Coast manager, of Westinghouse, were backed up by the biggest thing in Dams, at Boulder Canyon, last month when Nate Callard snapped them near the foundations of the power house, where any good electric salesman would be

...about the Trade

• THE INCANDESCENT SUPPLY COMPANY, Los Angeles, Calif., recently occupied new quarters at 1825-33 East 3rd St., Los Angeles, with new lighting fixture showrooms and a complete line of wiring supplies. The company was formerly at 1000 S. Los Angeles Street. Maxwell Rosen is general manager of the company which recently took over the personnel of the Western Light and Fixture Company. John Adams is manager of the wiring supply division.

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• DALLAS ENGINEERING CORP., Dallas Texas, manufacturers of fans, announces that Detsch and Co., 341 10th St., San Francisco, and Albert S. Knight, 3006 Western Ave., Seattle, have been appointed western representatives of the company. Stocks will be carried in both places.

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• KWIKON CO., Chicago, manufacturers of conduit fittings, has announced the appointment of Edward H. Bell, 5706 Long Beach Ave., Los Angeles, as its representative in the southern California territory.

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• WILLIAM G. COX has recently established a Pacific Coast district office of the Hynes & Cox Electric Corp., of Albany, N. Y., in Los Angeles at 1703 Beverly Blvd. The company manufactures the "Red Crown" automatic electric storage water heater.

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• HATTON-MOTE, INC. is a new electrical service and construction company as well as merchandising establishment recently opened in Seattle. M. C. Hatton, formerly of the Shell Oil Co. at Seattle, and H. L. Mote, formerly with Graybar in the same city, are partners in the new firm. Besides electrical construction, the firm carries refrigerators, cleaners, radios and appliances.

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• BOYD AND GRYDE have opened a new electric appliance business at 1514 West Seventh St., Los Angeles. Mr. Gryde was formerly sales manager for Otto K. Olsen in Hollywood. Hotpoint ranges, Frigidaire refrigerators and electrical appliances are being featured.

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• VANCOUVER CROSS-ARM CO., Vancouver, Wash., has announced the appointment of Maydwell & Hartzell, San Francisco, and Los Angeles, as its exclusive sales representative for Douglas fir cross arms in California.

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• GENERAL AIR CONDITIONING CO. recently moved from 2000 Fourth Ave. to 1209 Second Ave., Seattle, Wash.

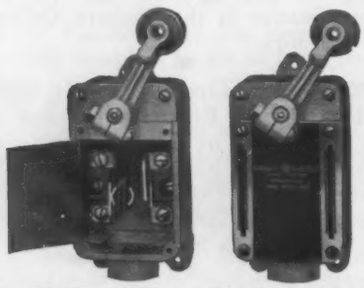
...in New Equipment

High Intensity Vapor Lamp

Announced as a new approach to industrial white light which gives rest to the eyes together with quick visual response even to details unknown under other commercial lighting, the new lamp perfected by the General Electric Vapor Lamp Co. of Hoboken, New Jersey, is designed to revolutionize the lighting of high bays. The lamp produces 14,000 lumens at a consumption of 400 watts. It is made with a Mogul screw base for vertical mounting. The lamp has an over-all length of 13 inches and is made for operation on 110 volt and 220 volt, 60 cycle circuits. Its average life is 1,500 hours.

Adjustable Box Hanger

An adjustable box hanger for installation between joists or studs which does not interfere with lathing has been developed by William Brower & Co., Palo Alto, Calif. The hanger is fully adjustable as to space used. The outlet box is locked in place by turning the box which tightens a lock nut. The whole assembly is made of galvanized iron. List price is $16 per hundred. A lath support has also been developed which can be used with this adjustable hanger. Both of these new wiring devices were developed by R. C. Evans, of William Brower & Co.

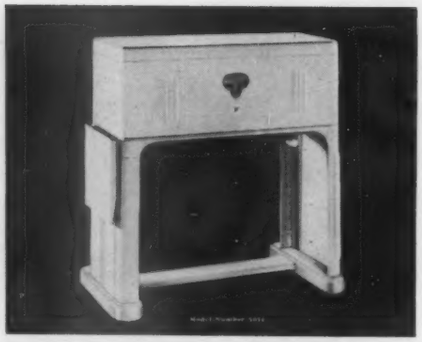


Small Track-Type Limit Switch

A small, track-type, spring return limit switch, intended for use in making or breaking control or indicating circuits at a fixed point in the travel of a part of a machine or mechanism, has been introduced by the General Electric Co., Schenectady, N.Y. The switch is designated as CR9440-A1A. It is operated by an 18 deg. movement of its operating arm from a normal position. It is claimed that an overtravel of 54 deg. is possible without causing damage to the switch. The operating arm can be adjusted to any position around the operating shaft simply and accurately by a precision mechanism. Double-break contacts are silver-plated. The switch, except for its operating arm, is enclosed in a die cast box. The switch is designed, it is said, for simple installation.

Double Door Refrigerator

Presenting four new models, each with a newly patented "Conservador," Fairbanks-Morse Home Appliances, Inc., Chicago, has announced its new line of 1935 electric refrigerators. The "Conservador" featuring is new, offering additional storage space for food items without the necessity of opening the inner compartment of the refrigerator. The interior finish is stainless, acid-resisting porcelain with rounded corners. Features include interior lighting, flat ribbon type shelves with the lower one removable, and eleven position automatic temperature control. Exterior finish is white Dulux with chromium and black door handles and hinges.



Streamline Ironers

The streamline appearance of modern commercial design has been applied to the new ironer line just announced by the Apex Rotarex Manufacturing Co., Oakland, Calif. Prevailing colors are Apex green and ebony black. End panels have replaced legs. All moving parts have been totally concealed. The conventional knee and finger tip controls have been speeded up. The Apex pressing feature has been improved through the use of a separate finger touch level located on the right side of the gear casing. Other features include a safety shoe release, motor and heat control switch with pilot light flush with stand top, thermostat controlled heat, collapsible end shelf and extended base to provide stability when the cabinet top is in the dropped position.

Universal Hospitality Sets

Two new Universal Hospitality tray sets are being offered by Landers, Frary & Clark, New Britain, Conn. One set contains an oven toaster, a walnut finished tray, a five compartment crystal clear glass dish, a walnut trimmed maple cutting block, and a stainless steel cutting knife. The other set is made up with the same items, except that a sandwich toaster and griddle replaces the oven toaster.

New Combination Range

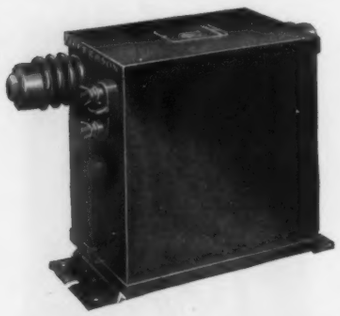
The Standard Electric Stove Co. of Toledo, Ohio, has recently added a new range to their line, known as Model 1450G. It has four electric units and two gas burners, an electric oven and an electric food warmer. The range is equipped with gas burners to sell in territories where gas is a desired auxiliary fuel.

Electric Portable Range

The Go Electric Portable Range, on which the manufacturer claims a complete meal for eight can be cooked, is being introduced to the trade by the Go Electric Corp., Natick, Mass. The top of the oven is a self basting roaster, and is large enough to hold a large fowl or roast. The lower part of the oven contains space for additional baking. Two units on either side of the oven will accommodate pans for boiling purposes. It is said that the oven is specially designed to give perfect heat circulation so that even biscuits can be baked. The construction of the heating elements is based upon a new principle and elements are guaranteed for one year.

Bristol Pyrometer Controller

Possessing "degree-splitting" characteristics that permit an accurate check over any heating process, a new pyrometer controller known as Model 478 has been announced by The Bristol Co., Waterbury, Conn. Included among the instrument's features are clean, non-arcing, non-oxidizing, non-corroding mercury-to-mercury electric contacts, sealed in glass; no need for relays; operating mechanism always visible; accessibility of all parts; full safety features; accurate control and simple working parts.



New Luminous Tube Transformer

A newly designed Jefferson transformer for luminous tube signs, which is over an inch narrower than previous models, has been placed on the market by The Jefferson Electric Co., Bellwood, Ill. These transformers have patented balanced mid-point windings, processed porcelain bushings, rubber gasket, and simplified mounting brackets. The core is made of high silica non-ageing steel. The coils are vacuum treated and imbedded in process compound to provide high dielectric strength, and rapid heat conduction which enables operation with slight heat rise. A single sheet of enameled rust-resisting copper bearing steel is used for the case. The transformer is listed by the Underwriters' Laboratories.

Safety Temperature Indicator

A new temperature indicator, placed on the market by Schweitzer & Conrad, Inc., Chicago, determines the operating temperature of buses, cables, disconnects, contact clips, terminals of oil switches, transformers and other similar equipment without shutting down equipment or disturbing any connections. The temperature is obtained by holding the tip in contact with the apparatus for a few seconds. To insure safety the insulated handle has an insulated guard ring. Specially designed thermocouples are used in the indicator, one at the tip, which is connected to a sensitive milli-voltmeter. The device can be used on systems up to 23 kv., and the scale of the instrument covers a range of 0 degrees to 70 deg. rise above ambient Centigrade.

Excessive Voltage Fuses

"Tattlelites," fuses designed to protect electrical equipment against excessive voltages, have been recently introduced by the Littlefuse Laboratories, Chicago, Ill. "Tattlelites" are a line of neon discharge tubes having break down protentials of 100, 250, 500, 1000 and 2000 volts, and operate by shunting out the overload. The application of these fuses are claimed to be numerous and of particular safety value to indicate radio frequency, resonance peaks, and high tension lines.

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General Elec. Supply Corp.
Graybar Elec. Co., Inc.
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Malleable Iron Range Co.
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Swartzbaugh Mfg. Co.
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Russell & Stoll Co.

Brackets, Wood
Locust Pin Co.

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Burndy Eng'g Co.
General Elec. Co.

Buses
Aluminum Co. of America ..

Cable Accessories
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General Elec. Co.
John A. Roebling's Sons Co.

Cables
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American Steel & Wire Co.
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National Carbon Co., Inc.

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Fire Proof Wall Co.
Johns-Manville Corp.

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Edison Gen. Elec. Appliance Co.
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Mend-It Sleeve Mfg. Co.
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Illuminating Glassware
Inland Glass Works, Inc.

Instruments, Measuring and Recording
The Bristol Co.
General Elec. Co.
Quality Elec. Co.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec'l. Instrument Corp.

Insulation
General Elec. Co.
Johns-Manville Corp.
C. D. LaMoree

Insulators
Corning Glass Works
Graybar Elec. Co., Inc.
Hemingray Glass Co.
Illinois Elec. Porcelain Co.
Lapp Insulator Co., Inc.
Locke Insulator Corp.

Meters
The Bristol Co.
General Elec. Co.
L. A. Nott
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec'l Instrument Corp.

Molded Material
C. D. La Moree

Motors
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Motor Starters
Allis-Chalmers Mfg. Co.
General Elec. Co.
Ward Leonard Elec. Co.
Westinghouse Elec. & Mfg. Co.

Oil, Lubricating
Union Oil Co.

Oil, Transformer & Switch
General Elec. Co.
Union Oil Co.

Panel Boards
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Photoelectric Cells
General Elec. Co.
Weston Elec'l Instrument Corp.

Pins, Wood
Locust Pin Co.

Pole Line Hardware
General Electric Supply Corp.
Graybar Electric Co., Inc.
Hubbard & Company
Joslyn Co. of Calif.
Kortick Mfg. Co.
Locke Insulator Corp.
Maydwell & Hartzell, Inc.

Public Address Systems
Electro-Acoustics Products Co.

Public Utilities
California Oregon Power Co.
Idaho Power Co.
Mountain States Power Co.
Northwestern Electric Co.
Pacific Gas and Electric Co.
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Portland General Electric Co.
Puget Sound Power & Light Co.
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Southern California Edison Co. Ltd.
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Edison Gen. Elec. Appliance Co.
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Ranges
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Malleable Iron Range Co.
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Walker & Pratt Mfg. Co.

Refrigerator Parts & Accessories
California Refrigerator Co.

Refrigerators
Frigidaire Corp.
General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
Malleable Iron Range Co.
Westinghouse Elec. & Mfg. Co.

Relays
General Elec. Co.
Leach Relay Co.
Ward Leonard Elec. Co.

Rheostats & Resistors
General Elec. Co.
Ward Leonard Elec. Co.
Westinghouse Elec. & Mfg. Co.

Service Organizations
Elec'l Testing Labs.
McGraw-Hill Book Co.
Northwest Elec. Light & Power Association
Pacific Coast Elec'l Ass'n
Pacific Coast Elec'l Bureau

Signs, High Voltage
W. D. Howze Sales Co.

Strand, Guy
Crucible Steel Co.
Maydwell & Hartzell, Inc.
Pacific Wire Rope Co.

Switchboards
Allis-Chalmers Mfg. Co.
General Elec. Co.
Square D Co., Inc.

Switches, Coin Operated
Welcome Meter Co.

Switches, High Tension
Bowie Switch Co.
James R. Kearney Corp.
General Elec. Co.
C. D. LaMoree
Pacific Elec. Mfg. Co.

Switches, Meter Test
General Elec. Co.
Meter Devices Co.

Switches—Pressure and Temperature
The Bristol Co.
Garland-Affolter Eng'g Corp.

Switches, Safety
Colt's Patent Fire Arms Mfg. Co.
Meyers Safety Switch Co., Inc.
Mongerson's Elec'l Mach. Works.
Parker Elec'l Mfg. Corp.
Square D Co., Inc.

Switches, Time
R. W. Cramer & Co.
General Elec. Co.
Sangamo Elec. Co.
Tork Clocks, Inc.

Switchgear
Allis-Chalmers Mfg. Co.
Condit Elec'l Mfg. Corp
General Elec. Co.
Pacific Elec. Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Terminals, Cable
General Cable Corp.
General Elec. Co.

Testing Devices
Electrical Facilities, Inc.

Tools, Live Line
James R. Kearney Corp.

WHERE TO BUY IT IN THE WEST

★ **DEPENDABLE TRANSFORMERS** ★

For Dry Type Industrial and Signal Use

Repair Service **for distribution transformers, Auto-starters and similar equipment.**

JEFFRIES **TRANSFORMER CO., 5706 Long Beach Ave., Los Angeles**
Electric Agencies, 2059 Webster St., Oakland, California

Transformers
Allis-Chalmers Mfg. Co.
American Transformer Co.
E. H. Bell
Gardner Elec. Mfg. Co.
General Elec. Co.
Jeffries Transformer Co.
Pennsylvania Transformer Co.
Sangamo Elec. Co.
Western Transformer Co.
Westinghouse Elec. & Mfg. Co.

Tubing, Elec'l Metallic
Aluminum Co. of America

Turbines
Newport News Shipbuilding & Dry Dock Co.
Pelton Water Wheel Co.

Valves
Pelton Water Wheel Co.

Authorized Factory Replacement Parts Service

●

Automatic, Easy, Gainaday, Horton, Meadows, Roto Verso and Universal Washers and Ironers

Parts and Rolls for All Makes
Washing Machine Parts Co.
1241 S. Hope St., Los Angeles

Washers, Clothes
Apex Rotarex Mfg. Co.
Elec't Appliance Service Corp.
General Elec. Co.

PARTS & ASSESSORIES

***For* SAVAGE** **Washers & Dryers**

● **PROMPT DELIVERY**
● **COMPLETE STOCKS**

Savage Distributing Co., Inc.
383 Brannan St., San Francisco

Little Giant, Inc., Ltd.
Savage Distributing Co.
Washing Machine Parts Co.

Water Wheels
Pelton Water Wheel Co.

Wire
Aluminum Co. of America
American Steel & Wire Co.
Columbia Steel Co.
Crescent Ins. Wire & Cable Co.
Crucible Steel Co.
Driver-Harris Co.
General Cable Corp.
General Elec. Co.
Graybar Elec. Co., Inc.
Indiana Steel & Wire Co.

Crapo
GALVANIZED PRODUCTS

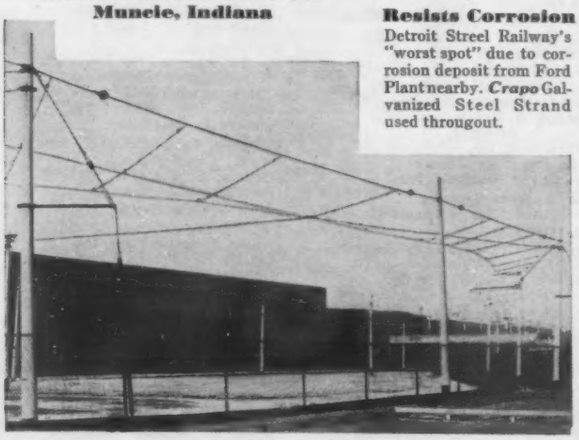
Where Conditions Are Toughest

. . . . there you will find *Crapo* Galvanized Steel Strand. Engineers know from years of actual experience that *Crapo pure* zinc galvanizing resists corrosion longer under the most adverse conditions. That is why so many leading companies specify *Crapo* Galvanized Strand and Wire on all new and replacement work.

Indiana Steel & Wire Co.
Muncie, Indiana

Steel Strand
● ●
Telephone Wire
●

Resists Corrosion
Detroit Street Railway's "worst spot" due to corrosion deposit from Ford Plant nearby. *Crapo* Galvanized Steel Strand used throughout.



C. E. Ingalls
Maydwell & Hartzell, Inc.
Pacific Wire Rope Co.
Providence Insulated Wire Co.
John A. Roebling's Sons Co.
Westinghouse Elec. & Mfg. Co.

Wiring Supplies
Gen. Elec. Supply Corp.
Graybar Elec. Co., Inc.
Russell & Stoll Co.
H. B. Squires Co.
Westinghouse Elec. Supply Co.

NOTICE

Remember June 1935

The year's biggest business opportunity in the $200,000,000 Western electrical market is to present your product before the Third Annual All-Industry Convention-in-Print—the June issue of Electrical West.

Index to Advertisers

March, 1935

Allis-Chalmers Mfg. Co. 8
American Steel & Wire Co. 5
Bristol Company, The 58
California Oregon Power Co. 2, 3
Colt's Patent Fire Arms Mfg. Co. 56
Columbia Steel Co. 5
Corning Glass Works 6, 7
Cramer Electric Co. 63
Edison General Elec. Appliance Co., Inc. 13, 14, 15, 16
Frigidaire Corporation 10, 11
General Electric Co., Nela Park 12
General Electric Co., Refrigeration Div. 53
General Electric Co., Schenectady 4
Idaho Power Co. 2, 3
Indiana Steel & Wire Co. 64
Jeffries Transformer Co. 64
Kearney Corp., James R. 57
Lapp Insulator Co., Inc. 57
Locust Pin Co. 57
Maydwell & Hartzell, Inc. 57
McLaughlin Glass Co. 57
Mountain States Power Co. 2, 3
National Carbon Co., Inc. 9
Northwestern Electric Co. 2, 3
Pacific Coast Electrical Bureau ..... Back Cover
Pacific Gas and Electric Co. ..... Inside Back Cover
Pacific Power & Light Co. 2, 3
Portland General Electric Co. 2, 3
Professional Directory 59
Providence Insulated Wire Co. 57
Puget Sound Power & Light Co. 2, 3
Savage Distributing Co. 64
Southern California Edison Co., Ltd. ..... Inside Front Cover
Square D Company, Inc. 59
Standard Electric Stove Co. 63
Thermador Electrical Mfg. Co. 63
Utah Power & Light Co. 2, 3
Washing Machine Parts Co. 64
Washington Water Power Co. 2, 3
Westinghouse Electric & Mfg. Co. 56, 58
Wiegand Co., Edwin L. 58

IMPORTANT
NOTICE
$1.20 has been deducted from the current month's charge for electricity, representing a discount equal to one-half of the difference between the charge this month (before such discount), and charge for corresponding month of last year.
SERVICE
WATER
ELECTRIC

THE STUB *will* STOP'EM

THIS advertisement was intended for January, but was never used.

While we felt that the Special-discount notice would be immensely helpful in selling the idea of "half-off electricity" we decided to await results before making any predictions.

Now, we can say emphatically . . . *the stub will stop 'em!* It *has* stopped 'em. By showing the exact amount of money which has been saved, it has done more toward putting the campaign across than almost any other factor of publicity.

That was to be expected. Everybody reads their bills. Everybody likes bargains. Here is proof that *extra* electricity IS a bargain.

Figures for January show that 40% of our customers availed themselves of the offer. Savings averaged 50c per bill. Total savings amounted to $135,000.00.

While February results were not compiled at the time this was written, enough data was in hand to show that more and more users of electricity are cashing in on this deal.

To the appliance trade, the implication in all this should be plain. *Extra electricity requires additional appliances.*

Any sales effort you put forth that ties up with HALF-OFF on EXTRA ELECTRICITY is sure to bring returns.

P • G • and E •

PACIFIC GAS AND ELECTRIC COMPANY

Owned — Operated — Managed by Californians

EW103-335

W A Worthington 1734XAT
Pac Gas & Elec Co
245 Market St
San Francisco Calif JE8/33

QUO VADIS

(WHITHER GOEST THOU?)

A silly heading perhaps for an advertisement addressed to electrical men, say you. Not so silly when you look at the facts. . . .

Power generated in California during 1934 was 519,572,000 KWH greater than in 1933.

Electrical consumers in California in 1934, increased 31,222 over those served in 1933.

Building permits in California for January 1935 were $2,134,782 ahead of January 1934.

There are two ways to go, in any business. The easiest is not to keep up with the latest sales methods, not to keep an adequate stock, not to care about cooperative plans or activities, not to have a concern with good public relations. This is the way that inevitably leads to failure.

The harder way means active participation in industry affairs and cooperative plans, the keeping of adequate stocks, a following of the latest sales methods, a sincere desire for satisfactory public relations and plenty of intestinal fortitude.

If you follow this latter way, the gain in percentages given above will most likely increase. And if they do, your share of the increased business will be proportionately greater.

QUO VADIS (Whither Goest Thou?) ELECTRICAL MEN

Pacific Coast Electrical Bureau

447 Sutter Street, San Francisco ★ 601 W. 5th Street, Los Angeles